

THE POLAR TIMES



January 2009

President's Letter

As I write in mid December, it is summer in Antarctica, the sun is up 24/7, tourist ships are running aground as usual, and the U.S. Antarctic Program is in full swing. At least as full swing as it will get this season. There isn't enough fuel available for U.S. aircraft operations to fulfill the obligations to science awards made for this season, as well as for planned construction and maintenance at U.S. scientific stations. Despite the recent drop in oil prices, the fuel presently being used in Antarctica was purchased in the 2007–2008 budget year, at an increase of \$8 million over the previous year. And NSF was instructed to plan for further increase of \$19 million in fuel costs for the 2008–2009 Antarctic summer. The fuel for this season either was delivered last season, or is on the way south now to be delivered in January. You get the picture.

A few months ago NSF sent a letter to scientists working in remote field areas of Antarctica, warning of drastic cutbacks in the 2008–2009 summer program. Even though the price of oil has dropped dramatically since July 2008, fuel delivered to the U.S. Antarctic Program for the present season was so expensive that cost, not

weather or aircraft availability, is the limiting factor. NSF cut back 20 percent on the number of the gigantic C-17 cargo jet flights to the continent and curtailed the number of medium sized LC-130s from eight to five planes, which leads to a reduction from 411 to 305 in the number of missions on the continent.

About 25 of the 150 scheduled research projects are being affected. Obviously the remote field projects are hit the hardest. Examples of reduced International Polar Year activities are the "West Antarctic Ice Sheet (WAIS) Divide Ice Core Drilling," and the aerogeophysical survey and other projects in the area of the Gamburtsev Subglacial Mountains beneath the East Antarctic Ice Sheet, (involving Germany, Australia, UK, China and Japan) which jeopardizes the completion of field observations. The Pine Island Glacier-Amundsen Sea Embayment project, in one of the most rapidly wasting areas of the WAIS, is reduced to planning only, this season.

As I write, the U.S. and the world are undergoing a dramatic financial crisis and NSF is operating on a continuing budget resolution. Science magazine (21 November) warns of a "World Oil Crunch Looming?" Richard Kerr writes "thinking \$100-a-barrel oil was just a

passing inconvenience? Think again." He goes on to explain the reasoning behind a recent report of the World Energy Outlook, 2008, and concludes "I just hope the Obama Administration doesn't look at the [current] price of oil and shove the problem to the back burner."

The issues I discussed above portend parlous times for polar research, which is increasingly necessary to address some of the world's most serious problems. The new Obama administration is planning a dramatic stimulus package for the Federal budget, which reportedly will include substantial increases for science and other global warming studies. Here's hoping polar research will get a share and the price of oil doesn't rise too fast.

On a closing note, I just learned from Scott Borg of NSF that the U.S. AP just contracted for fuel to be delivered to Antarctica next season at the present price. □

John C. Behrendt

APS President

(Some material above is taken from NSF letter of August 18, 2008, and Science magazine 29, August, and 21 November, 2008.)

An Important Message From Our Treasurer

Fellow members, from time to time over the last decade the Board of Directors has considered raising annual membership dues. Annual dues have been held at \$15 for over fifteen years. Action has been deferred on this question for several reasons including: 1) The Society was blessed with a comfortable reserve; 2) raising the dues might negatively impact our ability to attract new members and keep old ones; and 3) the Board was committed to providing a professional source of polar news and information to our members at the lowest possible cost to them.

As the saying goes, all good things must come to an end!

In the last ten years much has changed. *The Polar Times* has expanded and now provides a better, more thoughtful perspective of polar matters in a much-improved format.

Concurrently, the cost of printing, paper, ink, plates and labor has increased dramatically as have the cost of domestic and international postage. It is worth noting that the editors and contributors serve without compensation. All considered, I am obliged to report to you that our Reserve Account has now been eroded to the point where we can no longer absorb the increased costs of publishing and distributing *The Polar Times*.

Measures must be taken to reinvigorate the financial health of The American Polar Society.

We are exploring a number of areas of potential funding for non-profit organizations such as ours but, as an essential beginning, we must turn to our members as a primary and immediate source of income. Accordingly, a revised schedule of membership dues effective for calendar year 2010 will be announced in our forthcoming July 2009 issue. However, between now and July 2009, dues for new members and library gifts will be assessed at \$20 each except for Membership Accounts.

Please understand that an across-the-board increase in dues, given our current membership base, will not solve our funding problems over the long term and, at this juncture, we are urging that **all** members join in an effort to increase our membership rolls.

Here are some ways you can help the Society bridge our funding gap in 2009 and ensure our financial well-being in the years to come:

1) Establish a gift membership account: Send \$50 to our Membership Chairman and, over the course of a calendar year, you can gift three one-year, memberships to whomever you choose; 2) alternatively, do your part by participating in the "Each

One Get One" initiative suggested by Membership Chairman Charles Lagerbom. Find an occasion—or do it as a random act of thoughtfulness—to gift a friend or colleague with a membership in APS; 3) please consider gifting APS membership to your local public library and/or local school libraries.

It is axiomatic that the more exposure we afford the APS, the greater our chance of enrolling new members. As your treasurer, I am putting my checkbook to work and will gift five local libraries with subscriptions to *The Polar Times*.

The amount of increase in dues for 2010 and beyond will be a function of the number of members on our rolls. Consequently, your response to this appeal for adding new members will not only impact our cash-on-hand account but will be the major determinate in establishing APS dues in the years ahead.

Finally, the officers and Board of APS would like to hear any suggestions the members may have for enhancing our financial position in the near and long term.

With best wishes,

Dave Baker
APS Treasurer

Polar Shifts: The Changing Face of Exploration

by Moki Kokoris

Humankind has explored the north and south extremes of our planet since the days of Pytheas, who in 325 BC is believed to have made the first attempts to penetrate the Arctic Circle in his search to find a source of tin. As was the case in his day, dangerous oceans and life-threatening weather conditions still fetter explorers in their efforts to reach polar regions by sledge, ski, boat, and foot. It is only the explorers themselves who know what drives them, but the unanswered question remains: Is it the journey that changes man, or is it man who changes the journey?

Not one person who has witnessed firsthand the majesty of these white environs, or who has experienced the perils and hardships whilst getting there, remains untouched and



Global Warming-101 Ellesmere Island Expedition Team

American Polar Society

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are \$15 a year (\$17, foreign) and entitle members to receive *The Polar Times* twice a year. The American Polar Society is classified as a tax exempt organization under Sec 501(C)3 of the IRS Code. For more information about the American Polar Society, contact Kevin L. Bjella, *APS Secretary*, at 1.802.295.6881 or send email to kevin.bjella@erdc.usace.army.mil.

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unmoved. A shift in consciousness occurs as a result of these highly personal endeavors. Everything changes. Orientation changes. As new directions are sought, others are found. One compass bearing often leads to another which is even more profound and life-altering. This is the case in both literal and figurative terms.

Exploration inspired by fascination and individual challenge has yielded many firsts, as the long list of accomplishments in the annals of the Explorers Club will reveal. It is in the physical discovery of new places, new heights, depths, civilizations ancient or thus far unknown, where explorers find exhilaration that provides the rest of us with another window through which to view the richness of our world. These days, however, there is little left to explore as a complete unknown in the conventional sense. We now delve deeper into the subjects that have already been uncovered. This is exciting in its own ways, but what may be even more significant is the matter of what to do with the knowledge explorers gain, its economic benefits aside.

There is a noticeable trend occurring, the potential of which will hopefully grow exponentially, touching even those who cannot imagine themselves enduring the conditions and tribulations of polar exploration proper. Today, with the aid of modern technology, any man, woman or child can participate in these expeditions vicariously. There is so much to learn from these experiences, leaving the bone-chilling winds, cracking sea ice, white-outs, polar bear threats and the accompanying discomforts out of the equation. This leaves only the message being conveyed, its lessons to be learned, as the ultimate metaphorical summit to be attained. All we as observers need do is listen and watch as today's explorers try to show us new courses we should follow.

Will Steger is one such explorer whose exploration objectives have shifted from new discovery to education. Today he is leading an entirely new type of expedition, one into the realm of environmental stewardship. His past exploits are known to many, as his feats speak for themselves. The list of his most significant dogsled expeditions includes: the first dogsled journey to the North Pole without resupply (1986); the 1,600-mile south-to-north traverse of Greenland, known to be the longest unsupported dogsled expedition in history (1988); the historic 3,471-mile International Trans-Antarctic Expedition, the first

About Our Front Cover

The Will Steger Global Warming-101
Ellesmere Island Expedition, 2008.

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Branson.

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Will Steger

"POLAR SHIFTS" CONT'D FROM PAGE 3

dogsled traverse of Antarctica (1989-1990); and the International Arctic Project, the first and only dogsled traverse of the Arctic Ocean from Russia to Ellesmere Island in Canada (1995). His 45-plus years of polar travels earned him many awards, among them the 2007 Lifetime Achievement Award from National Geographic Adventure Magazine; the National Geographic Society's prestigious John Oliver La Gorce Medal for accomplishments in geographic exploration, in the sciences and for public service to advance international understanding; and both the Lindbergh Award and Explorers Club Lowell Thomas Award for his numerous polar expeditions, deep understanding of the environment, and efforts to raise awareness of current environmental threats, especially climate change.

As a recognized authority on polar environmental issues and a ceaseless advocate for the Earth's well-being, Steger has been invited to testify before the United States Congress, as well as act as advisor to many world leaders on issues of environmental protection. His pioneering work in adventure-based environmental education was pivotal as he founded the Global Center of Environmental Education at Hamline University in St. Paul, Minnesota, and the World School for Adventure Learning at the University of St. Thomas in 1993. In 2006, he formed the Will Steger Foundation (WSF), with the mission of fostering leadership and cooperation in environmental education and policy. The WSF uses polar expeditions to generate interest and awareness of the effects of global warming on the Arctic and Antarctic regions.

The two most recent global-warming-focused expeditions were the one to Baffin Island in 2007 and the second to Ellesmere Island in 2008, both launched under the appropriately named "Global Warming 101" initiative. These two endeavors, with their dynamic web-based component, vivid accounts in archived video dispatches and supportive educational resource content, provided authentic eyewitness accounts of climate change in polar regions that will dramatically affect each of us and our environment. The goal was to nurture grassroots efforts that lead to massive institutional reform and technological innovation. So, it is directly from the front lines of global warming that Will Steger is able to inspire, educate and empower people around the world to take action in finding global warming solutions.

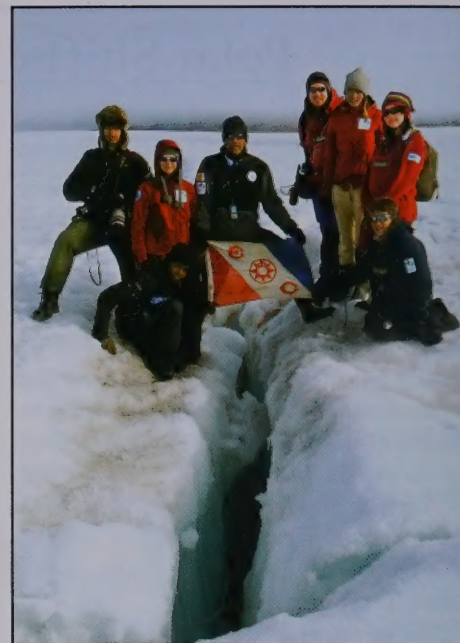
What is perhaps most interesting is that the majority of Steger's international team members—young accomplished explorers

The spot where they had eaten their lunch only hours earlier had simply drifted away right before their eyes....

themselves—are in their twenties, thereby setting a peer-to-peer example for their online and iP-

od-carrying audience. This new expedition methodology has proven to be very effective in mobilizing youth to get involved.

Another similar direction has been taken by Luc Hardy, a French-American venture capitalist, entrepreneur, and adventurer who



The Pax Arctica expedition, recognized as an official flag expedition, holding the Explorers Club flag over a crack in the Ward Hunt Island Shelf

describes himself and his latest goal thusly: "I am a nomad by nature. My attitude is—if you don't go, you don't know—which at times can be risky but more often rewarding. Travel nourishes me. My life is privileged, and with this blessing comes responsibility. The Pax Arctica Initiative was launched as a vehicle for sharing these experiences with a large public." A member of the Explorers Club who has led several scientific expeditions in the polar regions, Luc is now also shifting his attention toward educational endeavors.



Crossing meltwater with dog team



Campsite in the shadow of an iceberg

In the summer of 2008, he led a 16-person expedition to the Canadian Arctic composed of a diverse group of adults and Young Ambassadors, ages 9 to 17, to eyewitness and report on the changes occurring in the

Arctic as is beautifully described and documented in Hardy's new book

"I am a nomad My attitude is—if you don't go, you don't know"—Luc Hardy

Arctic Transitions—Witness to Change—Young Ambassadors in Nunavut. This book brings these ostensibly inaccessible regions to life through stunning photographs and stories from the young expedition participants themselves, who describe their impressions in their own words. We, in turn, witness the changes through their eyes.

As described in its own press release: "The Pax Arctica Initiative is a series of expeditions undertaken by environmental advocates in collaboration with Green Cross France and Global Green USA, designed to alert public opinion of critical environmental issues that endanger the Arctic region. Spanning a period of three years from July 2008 to 2010, Pax Arctica will emphasize focused research by ecological scientists and environmental advocates to explore and assess the ecological conditions and the geopolitical climate of the Arctic. The ultimate goal is to determine the steps needed to preserve the Arctic ecosystem for generations to come and to encourage the ratification of international policies to ensure the preservation of the Arctic habitat."

However, there was a singular event that coincidentally defined the team's mission. A major goal of the Pax Arctica expedition

was to explore the Ward Hunt Ice Shelf, but no one anticipated that Luc's

team would unknowingly become eyewitnesses to its breakup. Although young minds might not have understood the gravity of this milestone, the group's opportune presence was serendipitous because actual on-the-ground footage was

captured just as the breakup was occurring. The spot where they had eaten their lunch only hours earlier had simply drifted away right before their eyes....

It is clear and heartening to see that through expeditions such as the ones led by both Will Steger and Luc Hardy, we are offered a unique view of the people and places at the tipping point of climate change. Programs like these provide an international platform for furthering education, discussion, and civic engagement, as well as opportunities for public interaction with prominent policy makers, scientists, journalists and business leaders which are critical in this process. These efforts connect people to people, across the boundaries of nationality and culture.

On the changing face of exploration,



Pax Arctica team walking northwest from Ward Hunt Island over slushy snow -



Luc Hardy

these are today's explorers whose objectives are even more honorable than those who got "there" first or reached a summit "because it's there." These are the individuals whom we should endeavor to not only admire and support, but also emulate. And these explorers are our personal guides whose example and leadership it behooves us to trust and follow.

For more information, dispatches and photos, please visit <www.globalwarming101.com> and <www.sagaxexpeditions.com>

We wish to thank both the Will Steger Foundation and Pax Arctica for generously granting us permission to publish their photographs. □

The Musk Ox Story: A Knitter's View

by Helen M. Griffiths Howard



COURTESY PAT TURNER; PHOTO BY BARRY McWANE

Author Helen Griffiths models a qiviut nachag. John Turner, behind, is wearing a qiviut tunic.

In an earlier edition of *The Polar Times*, Herbert Drury described the excitement of capturing musk oxen in the Canadian Arctic. He was with John J. Teal, Jr., a human ecologist who had been inspired by explorer Vilhjalmur Stefansson. In the early part of the twentieth century Stefansson had collected the tufts of soft down or underwool shed by musk oxen and caught on the bushes, and he suggested it could be commercially used. In fact, he had sent a bale of it to the University of Leeds in England, where H.F.D. Atkinson, a graduate student, tested it and had suiting material woven. Building on Stefansson's idea, John Teal hoped to create an Arctic cottage industry based upon domesticated musk oxen.

The seven animals Teal and Drury captured in 1954-55 spent ten years on Teal's Vermont farm. Then, building on the successful results of that study, Teal set out in 1964 to establish a larger herd in Fairbanks, Alaska. The University of Alaska provided a farm, originally Jan Kovich's homestead, while Teal, who had formed the Institute of Northern Agricultural Research, obtained permission to capture 33 young animals on Nunivak Island, descendants of the Greenlandic musk oxen that were placed there in 1935.

When I joined Teal's Musk Ox Project, in 1964, half the animals had been captured but the farm still needed further fencing and

a handling barn. These I helped build, even though my title was Project Secretary. At that time not many people had heard of a musk ox, so the project caused great interest. In Teal's frequent absence I had the pleasure of conducting many interesting people over the farm, especially Russian, Canadian and other northern visitors.

Once the calves had been installed on the farm they were weighed daily, not only for health reasons, but particularly to tame them. The young animals were dehorned using the same procedure as for cattle. Musk oxen are not built like cattle (the Latin name *Ovibos moschatus* and the English name musk ox do not adequately describe them, as they are more closely related to goats than to cattle and have no musk), so dehorning turned out to be an unfortunate decision. The bulls' horns meet in a heavy boss that is intended to absorb

the impact of head-to-head charges at top speed. Consequently when mature, these poor animals had to wear helmets made of old tires, causing a few chuckles from tourists. Nowadays just the tips of the horns are kept trimmed to avoid eye injuries.

The fascination of musk oxen enticed many interesting employees, among them Susan Butcher of later Iditarod dog race fame. Dee McConnell was herd manager for a considerable length of time, and he might be met in the woods leading a musk ox on a halter, or hitching one to a sled. They were usually docile even as adults. Elsewhere their docility is called in question, but the daily regimen of bringing them in to the barn and frequent interaction with humans made our musk oxen quite tame. I even slept a summer night in the musk ox field, waking tousled to be introduced by John Teal to Bill Egan, Governor of Alaska.

Although Teal was primarily interested in the domestication of musk oxen, he also envisioned domesticating other animals such as ptarmigan,

eland and tapir, always emphasizing that they should be kept within their own climate zone and benefit the indigenous people. Later he established musk ox farms at Fort Chimo in Northern Québec, and Bardu, Norway. He also planned for further stations in Iceland and particularly Greenland, training two Greenland Eskimos as herders. I was thrilled one evening to watch one young Larseraq Skifte, a superb skier, rounding up the bulls on skis. Bright arc lights lit up the spray of snow crystals like an aurora against the velvet-dark sky as he swerved to chase a recalcitrant bull, and the long guard hairs swept back by the speed of the bulls' gallop.

Teal held that "An animal is domesticated when man actively intervenes in its breeding pattern.... in order to improve the qualities of [the] animal which are of value to man.... For obvious reasons, the animals concerned are often tamed, but the degree of tameness desired differs. In the case of the musk ox, it was decided to exploit the animal initially for its wool, to which the Eskimo word *qiviut* was given." (Draft grant proposal, ca. 1970.) Teal's purpose in domesticating musk oxen was social; it was intended to benefit the indigenous people. He envisioned them as Arctic sheep in small village-operated herds, providing their downy underwool to Native knitters. This view was later modified.

Life on the farm was relaxed and fun. Our staff meetings were relaxed, and we would often work at a picnic table pinning out the knitters' scarves while talking. Visitors were allowed to come right into the pastures with the musk oxen, and taught to hold their ground



A group of Yup'ik Eskimo women beginning to knit samples in a lacy pattern before attempting it in qiviut.

COURTESY HELEN GRIFFITHS HOWARD

if one of the cows took it into her head to test them with a mock charge. This didn't work so well for an elderly mother of a photographer, but she wasn't hurt.

In the office I responded to many enquiries both about the animals and their *qiviut*. Among the latter was expert knitter Dorothy Reade of Eugene, Oregon. She tested *qiviut* alone and combined with other fibers, then she recommended using it in scarves, hats, etc. rather than gloves or sweaters, since it is a fine and delicate fiber. This corresponded with Atkinson's earlier recommendations. The material Atkinson wove was made up into two suits, one for Stefansson and the other was given to Edward, King of England. Stefansson's suit came to an unhappy end: his wife gave it to the Salvation Army! I wonder about the King's. I suspect that the soft *qiviut* did not make a very smart suit for, although *qiviut* has good tensile strength, it neither withstands much abrasion nor has much body.

In the 1960s most knitting patterns relied on dizzying written abbreviations, but Dorothy Reade had developed a system of charting stitches, so that a knitter could see the full design. Ann Lillian Schell joined the project as Textile Specialist in 1966. Dorothy taught her and me how to design and chart knitting patterns. Thanks to this method we were able to provide complicated lace patterns based upon designs taken from native artifacts. These "village designs" became specific to each community and they required neither literacy nor fluency in English.

In December 1968 Ann Schell conducted the first *qiviut* knitting workshop in Mekoryuk, the village on Nunivak Island. The original design came from an incised ivory harpoon head and she taught several women how to knit this design from charts. They already knitted mittens, so knitting lace patterns built on their knowledge. Katie Tootkaylok even owned a spinning wheel, and she interested other villagers, who became eager to learn when they saw how the work could be taken anywhere and that payment was immediately forthcoming.

The first garments were scarves with a "harpoon" design down the center. Then this pattern was tripled to become lace all over. Eventually broader scarves became shawls; scarves knitted in the round were smoke-rings, known as *pelatuks* or *nachags*. Caps and tunics were added, but because *qiviut* is such a fragile fiber, no gloves, and only prototype vests, were made. Katie designed a cap and a baby cap with earflaps.

After Ann Schell moved to Barrow in December 1969, I conducted my first workshop. Although I was partially ready, John sprang it on me suddenly. He informed me that I would leave the next day. I gathered needles and practice yarn as well as *qiviut*, a sample pattern and a few clothes and traveled to Anchorage with him. Thence I flew alone to Goodnews Bay, a Yup'ik Eskimo village on the coast, expecting a fine welcome. I arrived, but no one had ever heard of me. One kind Eskimo lady took me under her wing and gave me lodging. I found the Village Council president and arranged a village meeting. They made me use an interpreter, which was nerve wracking, but after a few days I had entered into village life, taking my first *maqe* steam-bath, going ice fishing and eating seal stew. The *maqe*, or steam bath, was unforgettable, as afterwards I froze to the wooden box I sat on in the entryway. It came up with me when I tried to stand!

Ann held workshops in Wainwright, Shishmaref and Barrow. I went to Point Hope, Marshall, St. Mary's, Nightmute, Toksook Bay and twice to Mekoryuk for follow-up workshops. One of the elders I visited at home expressed herself in an unusual way. She could tell I could not understand her Yup'ik, so she pulled a hymn book off the shelf and found a selection that be-



Paul Wilkinson with newborn musk ox calf



Ann Lillian Schell wearing a "Single Harpoon" *qiviut* scarf, with Helen Griffiths clad in a shawl of raw *qiviut* recently shed by a musk ox. A partly blocked *qiviut* scarf is in the foreground.

COURTESY HELEN GRIFFITHS HOWARD

gan "I'm so glad..." and pointed to it with a warm smile.

Each time a knitter sent in a garment it was carefully checked for mistakes, fulled and blocked on a board, folded when dry and packaged with a gold label signed by the knitter. Some was piece-dyed. Our office on campus became a regular stop on bus tours and many tourists bought these unique products. We had *qiviut* fashion shows in Fairbanks and Juneau, made brochures, contacted some commercial outlets, including Neiman Marcus, and sold items direct by mail.

On 23 November 1970, the Musk Ox Producers' Cooperative, called Oomingmak, was formed. This cooperative still flourishes with a mostly-Native board. A tiny building in downtown Anchorage is its hub, ably managed by Sigrun Robertson. *Qiviut* garments are sold in much the same way as we did in the beginning: direct to the customer, by mail or through small exclusive outlets. They also have a website at <www.oomingmak.com>

My records show that, by 1972, there were 31 knitters in Mekoryuk, who made 100 scarves, 41 caps, six tunics and 14 smoke-rings in the six winter months. Nowadays, of 173 knitters, there are 53 from Mekoryuk, including three generations. Mekoryuk has always been leader of the thirteen villages involved, probably because of its island location and proximity to wild musk oxen.

In 1999, Oomingmak received a grant from the Catholic Campaign for Human Development to look for members in new areas. Celebrating the cooperative's 30th Anniversary and the addition of these new members, they introduced a new type of garment. Calling it the Tundra and Snow line, some of the *qiviut* is bleached and blended with silk.

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The Dolgans and Their Mammoths

by Moki Kokoris



COURTESY OF JEFF DYREK, 2002

Jeff Dyrek, member of the 2002 and 2003 North Pole expeditions (and proud APS member), in front of the mammoth tusk collection in the Khatanga ice tunnel.

As we continue the series about the indigenous peoples of the North, this article will introduce one of the lesser known groups of central Siberia, specifically the Dolgans.

The Russian North—or Rossiyskiy Sever, extends across a distance of 6,000 km from the border of Finland all the way to the Bering Strait and the Pacific Ocean. It encompasses vast areas of taiga (boreal forests), tundra (treeless wetlands and pasture lands), and polar deserts. Siberia, which is just one region within this zone, alone covers nearly 70 percent of the territory of the Russian Federation, which speaks to its vastness.

Approximately 20 million people inhabit this expansive area, 180,000 of them belonging to the 40-some different aboriginal groups—the indigenous peoples of the Russian North. The majority of them live in small villages close to their subsistence areas where they still pursue traditional occupations like reindeer husbandry, hunting and fishing.

Coastal cultures inhabit areas with significant sea mammals (walrus, whales, seals), particularly along the shores of the Bering Sea. River cultures are more prevalent in the Far East. The tundra and taiga cultures, however, are more widespread and occur throughout the Russian North as a result of their nomadic or semi-nomadic subsistence lifestyles as they follow their reindeer. One such Siberian tribe is the Dolgans, its population estimated to be little more than 7,000. Anthropologically, they

belong to the North Asiatic group of the Mongolian race.

Currently, the Dolgans inhabit the eastern territories of the Taymyr Peninsula (see map) where they typically experience severe winter conditions with -60°C temperatures and winds of 120 km per hour. Anecdotal, Oimyakon in the neighboring territory of Yakutia, the coldest documented settlement on Earth, is known as the “Pole

of the Cold,” where the mercury commonly drops to -70°C .

Still following their traditional nomadic lifestyles, the Dolgans are reindeer breeders and hunters, living in baloks which are small rectangular structures covered with reindeer skins. At 3 by 4 meters in size, they are just large enough to fit on sleds that are pulled by up to six pairs of reindeer as their owners travel across the vast tundra in search of new pasturing locations. A balok houses an entire family. Inside each balok there are two or three beds, a table and a wood stove, yet even with the stove burning wood at full capacity, the interior temperature of these movable huts rarely rises above 15°C in mid-winter.

For toddlers, the Dolgans use sled-cradles that are placed amongst the reindeer which provide welcome warmth. During the winter, the Dolgans wear thick overcoats, made from reindeer hides combined with other skins such as Arctic fox, and beautifully decorated with intricate beaded geometric designs. Applied art includes mammoth bone carving and embroi-

dery. The Dolgans’ only musical instrument is the jaw harp.

Originally, the Dolgans were shamanistic. They believed that the shamans could guard them against evil spirits, called *abaasy*, who were thought to cause sickness by entering a person's body and gradually devouring the individual's soul. Other benevolent spirits, called *ayy*, were thought to dwell in odd-shaped stones or antlers.

Although their adopted Christian faith continues to combine old animistic beliefs with today's holiday traditions, the Dolgans still follow the Evenk calendar which is divided into four seasons with 13 Bega (lunar) months, each named according to the traditional activity at the given time. For example, Gobchon-Bega means hunting moon, Syru-Bega is reindeer buck moon, Keta-Bega is the salmon moon, and Sigal-Bega is the moon of hunger.

As among the Yakut, the Dolgan people greatly revered storytellers. They particularly favored animal tales that told about the origins of the different clans. The Creator Mother of the Dolgans was Mammoth—Heli. According to the myth, the world was originally very small, mostly covered by water

with insufficient land on which to pasture the reindeer. So the people complained to Heli. The Mammoth wandered about in the water and found Dzhabdar, the Serpent,¹ and persuaded her to help dry the world and create more land. Heli then plunged her tusks into the sediment under the water and brought up clay, sand and stones. These became the mountains and the cliffs. The Serpent then wriggled into the new formations,

creating rivers which dried out the land. This story is perhaps why the mammoth is still considered to be the sacred beast. However, it is the real woolly mammoth of the last Ice Age that thousands of years after its extinction still helps these indigenous tribes earn a living.

Today, as do all other indigenous peoples



Taymyr Peninsula indicated in red.
Cartographer: Hugo Ahlenius, UNEP/
GRID-Arendal

of the Arctic, the Dolgans face environmental issues in their remote North. The nickel, copper and cobalt factories of Norilsk are contaminating the regions traditionally relied upon for reindeer husbandry, and overhunting is decimating the last herds of wild reindeer as many Dolgans turned from herding to hunting. The increased use of snowmobiles in the tundra is an added factor of pollution and human pressure on the pristine environment. All of these relatively new conditions are forcing the people to seek new sources of income and livelihood.

As a result of climate change, warming temperatures are exposing the fossilized bones of valuable prehistoric fauna such as



PHOTO CREDIT: JEFF DRYER, 2002.

Dolgan ceremonial boots with bead decoration.

mammoths and woolly rhinos. Finding these bones is not at all unusual for the nomadic native people of the region. Roaming the land with their reindeer herds, they often come across partial skeletons.

In some areas of the Taymyr, due to the rapid thawing and breakup of the permafrost, the bones pop up to the surface at every few meters. Recent bans on elephant ivory turned Japanese and Chinese markets toward fossilized mammoth ivory for which private collectors and institutions will pay generously for the best specimens. Russian traders pay \$8–\$156 per kg of mammoth bone, but curled tusks, some up to 5 meters (15 ft) in length, are the most highly priced specimens. If lucky enough to locate good quality bones, a Dolgan can earn as much as \$7,800 in just one day, the equivalent of one year's income by conventional means.

Still, it is the Russian traders themselves who make most of the money since private collectors will pay up to \$20,000 for a well preserved mammoth tusk. A complete skull

in excellent condition is valued at \$30,000, while an entire reconstructed mammoth skeleton can fetch between \$150,000 and \$250,000.

Although the remains of many mammoths have been discovered, none has excited the public's imagination like Siberia's "Jarkov Mammoth." Its massive tusks were found in 1997 by the 9-year-old boy of the Dolgan family, Jarkov. This mammoth was determined to be about 47 years old when it died almost 20,400 years ago after getting stuck in thick clay at the bottom of a pond.

A French mammoth-hunter, Bernard Buigues, spearheaded the project to recover the Jarkov Mammoth. In September, 1999, introducing a new technique, the CERPOLEX/Mammuthus team excavated a huge block of frozen sediment that likely contained the remains of the mammoth. This 23-ton block of permafrost was successfully airlifted by an MI 26 helicopter and placed in a sectioned off portion of the underground network of service tunnels in Khatanga, about 250 km south of the locality (Bolshaya Balakhnya River) where the Jarkov Mammoth had been discovered. The goal of the team was to defrost the frozen block in the safety of the ice tunnel and to extract and document data from the sediment as well as from the mammoth's remains.

In following field campaigns, the team collected thousands more fossil bones at several other localities on the Taymyr Peninsula. Another block of ice, weighing approximately 1,100 kg, containing a hind section of the Fishhook Mammoth, was brought to the same ice tunnel for further study. This block was cleaned in the summer of 2000. Part of the skeleton was still in anatomical position, and among other bones, six vertebrae thoracalis, two vertebrae lumbalis, and 16 ribs were exposed. It became clear that some of the soft tissue had been preserved inside this block of frozen sediment, including remains of the stomach and its contents which could pro-



PHOTO CREDIT: JEFF DRYER, 2002.

The frozen ice block containing the remains of the Jarkov Mammoth. Its tusks were reattached during excavation and transport, as insisted upon by the Dolgan elders as a way of paying respect to its spirit and to guard against a potential curse.

vide significant scientific data.

Scientists attending a conference held shortly thereafter in Rotterdam declared that the Khatanga ice tunnels, with their constant temperature of -11°C to -15°C , were the best place to keep these late Pleistocene faunal remains in the optimum state of preservation for future research (radiocarbon dating, DNA extraction and sequencing research) such as the Woolly Mammoth Genome Project initiated by Penn State University. The ethical ramifications of the possibilities aside, if only Michael Crichton could have stayed with us long enough, he might have witnessed the first example of cloning that could yield a real live representation of his Jurassic Park storyline, thereby removing the "fiction" from "science fiction."

Let us hope that the Dolgans—who, along with their fellow indigenous groups that still inhabit the Arctic North, continue to rely on their unbelievable endurance and fight tenaciously for their cultural survival—do not follow in the muddy footsteps of the woolly mammoth into extinction. □



PHOTO CREDIT: © NICOLAS MINICASSON

Dolgan herder and his balok surrounded by reindeer.

Due North



by Arctic Contributing Editors
Herbert R. Drury and Moki Kokoris

Defining Books

HERB: Once in a great while a book comes along that fits in perfectly with one's own experiences or past, and recently several such tomes have come to my attention, two of which I will review here-with. Then I will discuss some of the recent events in the Arctic as space permits.

The first book was authored by H. Robert Krear, a former Tenth Mountain Division veteran living in Colorado near where I once lived. It is entitled *Four Seasons North: Exploration and Research in the Arctic and Subarctic*, edited by Terri Garrett, Vantage Press, Inc., N.Y. 2006 (368 pages).

Here is a book by an author who is "a man after my own heart," as the saying goes. Bob Krear has done many of the interesting and exciting things in his life that I envisioned for my own. This fine book is a compilation of his four major trips or expeditions to two Arctic and two Subarctic locations. The author apparently kept extensive notes on virtually every day of each project so that he is able to give us full details of all his endeavors and exploits. He even uses a title that I once hoped to use for a book of my own that is still unwritten! Anyone who loves nature, the great outdoors, biology, exploration, or scientific research should enjoy this volume.

Dr. Krear grew up in Pennsylvania and majored in forestry at Penn State University. He served in World War II as a member of the illustrious Tenth Mountain Division ski troopers in Italy, many of whom I have met, skied with, and admired. In addition to the adventures described in this book, he has also written a very successful one about that Italian war campaign of the 1940s. He then went on to advanced degrees at the universities of Wyoming and Colorado.

Two of his trips were to the Aleutian and Pribilof Islands in the Bering Sea off of western Alaska. Two others, my favorites, were to subarctic Quebec/Labrador and the marvelous Brooks Range of northern Alaska long before there were many people there. I cannot think of a place I personally would have wanted to visit more than upper Alaska where his group did ground-breaking research that helped establish the Arctic National Wildlife Refuge in 1980. He was also extremely fortunate to work with Olaus Murie and his wife Mardy, who pioneered such basic field research in parts of Alaska and the Arctic back when the U.S. Fish and Wildlife Service was still called the Bureau of Biological Survey. In the process of his research he got to meet, and often worked with, many other fine biologists and scientists in the polar regions and elsewhere.

He also lived and worked for a while in the Jackson Hole area of Wyoming, along with the Muries and other researchers like the famous Craighead brothers who worked on bears. That was one of my own favorite places to visit in college days where both my brothers were lucky enough to work and play for a couple of summers, much to my envy! Krear went on to work in several national

Dr. Krear came very close to disaster at least twice with barren ground grizzly bears.

parks and at least four universities, as well as travel world wide. How can one guy be so fortunate?

I can touch upon but a very few of his encounters over the four seasons of field work that he did. My favorite area he describes was the in the south-central Brooks Range of Alaska with the Muries and others. As he says, this was, at that time in 1956, the last remaining undeveloped or unexploited region of North America, and was being studied to determine its qualifications to become our last major wilderness area to be preserved. The expedition was backed by several national environmental groups and other concerned citizens who wanted to save this incredible region from oil development or other exploitation, which has now been accomplished in part. But the north coastal section, called "Area 1002," still has yet to be officially preserved by the U.S. Congress, much to the consternation of many Americans.

The group was flown into remote campsites on the Sheenjek River south of the Brooks

Range to study and collect animals and plants found in that wilderness. They had no guns along, and Dr. Krear came very close to disaster at least twice with barren ground grizzly bears, not to mention encounters with wolves and Canadian lynx! Of course they saw some of the countless wild caribou that still migrate through the region and into the Yukon Territory of Canada. I personally know what that was like as we flew over thousands of them on the 1954 John Teal Musk Ox Capturing Expedition that I wrote up for the July 2007 issue (pages 26-28) of *The Polar Times*. His many other adventures with wild creatures of every description, both mammals and birds, from rodents to eagles, are far too numerous to enumerate here. We can only enjoy reading about the once-in-a-lifetime adventures described herein so well by Robert Krear. More people are visiting those remote places nowadays than ever before, so much of what is recorded in these fascinating pages will unfortunately never be the same!

I cannot begin to describe all the adventures, problems, discoveries and results of this man's achievements in the four very different places he worked. Each main section, plus the unique supplementary appendices, has its own flavor that will greatly add to one's knowledge of those remote locations about which most of us can only dream.

The second book I wish to review just appeared in September, and was written by Spencer Apollonio, one of my colleagues of 1952, who had a story in the July 2008 *The Polar Times*. (See "Two Arctic Journeys—a Contrast in Techniques," pages 14–15.) He titled his book *Lands That Hold One Spellbound: A Story of East Greenland*, University of Calgary Press, and Arctic Institute of North America, Calgary, Alberta, 2008 (322 pages. No. 11 in Northern Lights Series).

I just learned of this book when my friend, Spencer, had a copy sent to me for review in this publication. With 20 black-and-white photos, nine maps, and two tables, it is the first ever account of the entire story of East Greenland, from pre-history to modern times. I was thrilled to get it as I have been to West Greenland three times, but never to the east coast. I had read accounts of some of the many explorers to this remote area while doing research for my masters thesis on musk oxen and also part of the story of Nazi Germany's attempt to establish weather stations there during World War II. So it was with great personal interest that I read this unique story that anyone interested in history or the Arctic will surely enjoy.

Spencer was with us at Thule in Northwest Greenland, and eventually, as he tells us, made it to Nord Station in Northeast Greenland. I almost had a chance to work briefly at Nord myself that summer, but unfortunately someone else got the job. A few of us did get to meet Count Eigil Knuth who took us over to the Danish/Eskimo village of Thule where we got to see and photograph some of the Natives, one of whom was supposedly related to the Eskimo who accompanied Peary to the North Pole. Knuth is just one of many people whose extensive works in Greenland are covered in this history. "Spence" also drove us over to Walstenholm Fjord, in North Star Bay, in a military truck where we saw first hand many icebergs, seals, Eskimos in kayaks, stone sealing camp remains, and the great Greenland Ice Cap itself, upon which I was later to spend several months in both North and South Greenland. Apollonio went on to 13 more trips to the Arctic wherein he helped to establish a research station on Devon Island in northern Canada for the Arctic Institute of North America before eventually becoming Director of Marine Fisheries in his home state of Maine.

Space allows me to review but a fraction of the many people, ships, expeditions, and discoveries made by a large number of scientists, adventurers, hunters, colonizers, and other visitors to Greenland. These include people from the first pre-historic tribesmen wandering from Asia across Alaska and northern Canada to the north and west coasts of Greenland, to modern day airmen doing aerial photos of the most remote parts of this immense, largely empty, ice-covered land.

Much of West Greenland was colonized long before anyone ever ventured into the eastern areas of the country and is well documented elsewhere. But East Greenland is protected from approach by a huge stream of giant icebergs and floes that comes down from the Arctic Ocean to become compressed against the coast by the Greenland Current between there and neighboring Iceland. Access to what little open land there is must be through that nearly impenetrable screen of ice, snow, rain and high winds that exists there year-round.

This author takes us through a very complete list of people who came to East Green-

They came by ship, dog team, rowboat, and afoot.

land to explore, study, and help colonize that part of the country beginning with the early Norsemen like Eric the Red, then a whole series of folks from several European countries who came to fight their way onto the land. They came by ship, dog team, rowboat, and afoot. Many of them had to battle their way through heavy ice, high winds, rain, cold, heat, insects, and starvation just to survive the vicious elements in that distant, unforgiving land, much less accomplish any scientific or other work. But with repeated attempts and persistence, great things were done which finally opened up the country and made it livable. It is amazing to me that so few of them actually died when given the conditions most of them faced. Just a few of their names include: Boyd (an American woman), Erichsen, Mikkelsen, Knuth, the Kochs, and many oth-

ers such as: Clavering, Courtauld, Graah, Koldewey, Ryder, Scoresby, Wager, Watkins, Wegener, Wordie, and a whole host of other leaders and support personnel.

I was especially interested in the work of two of these determined scientists, Knud Rasmussen, and Eigil Knuth. Our ABC-TV cameraman on the John Teal Musk Ox Capturing Expedition of 1954, noted earlier, was Nils Rasmussen, son of Knud, living in New York City at that time. I only wish I had been able to "pick his brain" more fully about his father's exploits and discoveries made early in the 1900s across North America from Alaska to Greenland, where he founded the Danish village of Thule in 1910. That is where Spencer and I, among others, including Larry Taylor (see "Arctic Summer 1952," pages 22-24 in the July 2008 *The Polar Times*) worked for the U.S. Weather Bureau during construction of the huge Danish/American air base there. Apollonio became better acquainted with Count Knuth, and details much of his sustained efforts made over several years in North and Northeast Greenland, at the Nord research and weather station in Peary Land, from where he carried on much of his exploratory work.

Another part of this book that interested me was Spencer's extensive coverage of the efforts of Nazi Germany to set up illicit weather stations in East Greenland during World War II. I had once read an account of those attempts, but did not remember just how long and involved their "invasions" actually were. During the war, Denmark and America worked together to protect Greenland shores

CONTINUED ON PAGE 12

"MUSK OX STORY" CONT'D FROM PAGE 7

These warm caps and headbands have color contrast, not lace designs. But the original "village patterns" are still produced by the first villages to knit with *qiviut*.

From the beginning, pricing has been based upon the number of stitches involved. Since 1993 the knitters have also been receiving annual dividends, based upon their work output. The dividend began at 10%, but has increased to 40% in 2007. Not counting the dividend, the total paid to knitters has been well over \$100,000 annually for several years, so it is obvious that small though this cottage industry may seem, it has made a considerable financial impact in villages where local jobs are hard to find and where exorbitant freight costs mean prices triple those elsewhere.

Teal moved the musk ox herd from Fair-

banks to the west-coast community of Unalakleet in December 1975. Initial enthusiasm there had waned after a change in the village council, and the herd of 173 musk oxen was expensive to maintain. In 1984, two years after John Teal died, the animals were moved to Talkeetna, then subsequently to Palmer by the Musk Ox Development Corporation, a non-profit group formed by members of Teal's family and loyal Project employees. Paul Wilkinson nursed John in his last days, and has been the most faithful supporter and guide of the Musk Ox Project ever since.

The Palmer farm hosts many tourists, which helps to fund operations. As a non-profit corporation MODC also accepts donations through Friends of the Musk Ox. "Friends" may adopt a musk ox, and they receive periodic newsletters. Volunteers are

often enlisted to help on the farm or with *qiviut* collection. Recently I was set to reading Shakespeare to the tiny calves. Volunteers also assist in gathering *qiviut* in early summer by using Afro combs and fingers to ease the wool off the animals. The *qiviut* is then sold to the cooperative, which ships it to cashmere processors for spinning and eventual distribution to the cooperative's members.

Nowadays Stefansson's and John Teal's dream of an Arctic cottage industry based upon a domesticated Arctic animal may be considered mature. It is over half a century since John Teal and Herb Drury tested their capture methods on an adult bull musk ox in the Thelon Game Sanctuary and with much trepidation released the angry beast again, preferring to devote their attention to youngsters easier to tame and domesticate! □

as part of the Western Hemisphere that President Roosevelt had declared we would defend. As part of the agreement between our two countries, we built several air and weather bases in Greenland, including Thule, Nord, and "Blue West 8" (BW-8) in West Greenland where I also was for a time. We also had ice breakers and warships patrolling the coasts of Greenland, along with the Danes, and managed to stop the Nazi movements. But the actions on shore, and the incredible suffering endured by some of the participants is as fascinating story as one can find anywhere, in fact or fiction! One guy hiked 230 miles in 11 days in the cold to escape the Germans! This is a thrilling story that makes reading of this amazing tale worthwhile in itself.

The author brings us up to date in the final section of his book. He tells us that those folks living in all parts of Greenland, still under Danish rule, have become "civilized" and "modernized" like most of us nowadays. But that may soon change as a very recent vote nationwide, not binding upon Denmark, was in favor of independence from the European nation. Denmark has said it will honor the wishes of the Greenland residents, but as of this writing, no decision has yet been made to our knowledge. For good or bad, the island now benefits or suffers from most of the same things that we have, like TV, fads, alcoholism, crime, and comforts of home, even though virtually everything must be shipped in by plane or boat. So it should be interesting to see how

the future of this no longer isolated land will play out after such a struggle by so many determined people to discover its well-hidden and protected, but limited resources. There are still relatively little agriculture of a commercial nature, limited mining of any great importance, and dwindling fish stocks as in many of today's over-fished seas. But with modern airfields, ships, and a blossoming tourism industry, East Greenland and the entire land may yet become one nation of independent souls able to survive with the help of today's technology and their own stubborn ingenuity! We have Spencer Apollonio to thank for a unique, eye-opening look at what has probably been the least known Polar land outside of Antarctica, and the story of its emergence into the world of today! Thank you, Spencer!

Arctic Notes

As long as we are on the Arctic and Greenland, I will note just a few of the many recent events of interest that have occurred. BBC News reported in August that a research team in Reno, NV studied an ice core from Greenland for the presence of several toxic chemicals in coal smoke. They found good correlation of atmospheric pollution, deposited in Arctic ice as far back as 1772, relative to the rise of the Industrial Revolution, the gasoline combustion engine, and recent reductions due to laws restricting emissions. These semi-permanent records help us to know how our environment has changed over the centuries, and give clues to the causes of health

problems of people everywhere.

Other reports, from numerous sources, continue to be published about the increasingly rapid loss of ice from melting and breakup of ice shelves in many places. Just a few of these include: extensive new cracks in the great Greenland Ice Sheet; the rapid melting of South Greenland glaciers (which I personally observed beginning in 1953); and the near record losses of ice in the Arctic Ocean, not to mention those of the Antarctic. A computer formula for better prediction of iceberg "calving" off of glacial ice shelves has been developed at the University of Pennsylvania. Some such ice floes extend as much as 500 miles from land out to sea without breaking off, while others break off in just a few miles. The speed at which the glacier itself moves toward the coast appears to control this poorly understood process.

Further new information tells us that Arctic ice thickness overall has declined by as much as one fifth in some areas, in the past year or so alone, after remaining fairly static over the previous five, as shown by satellite data. And the total area covered by ice shrank from an estimated 5.32 million square miles in 2005, to about 4.13 million square miles by September of 2007. Ice is down by an average of ten percent below the 2002-2008 norm, and is down as much as 19 percent in the western Arctic. Total loss of Arctic ice may now be expected, if these rates continue, by 2030-2040 rather than by, perhaps, 2080 as previously estimated, with all the problems that could entail. □

An Ice Place to Visit

Moki: It's never a simple task to decide what to write about in this section, especially in light of the unfair limits on page acreage and the fact that my colleague, Herb, and I must share these tight quarters. But I kinda like the guy, so fine, I'll play nice.

Let's see now, I could write about the metabolic rate of the Arctic nudibranch (sea slug), but that might be journalistic suicide. I could explain, in full painful detail—supplying the scientific data to support the physics—why it is not intellectually prudent to show off to your friend by licking a metal flagpole in the dead of February in Thotckholm, but then you'd all laugh at me. So, after fretting briefly about my topic options dilemma, and in the interest of keeping my portion of Due North mirthful as I have in past issues, I have chosen to write about... sleeping around.

Now, now. Don't make any unfair assumptions here. I assure you that I consider myself an honorable and proper journalist. What I am specifically talking about is sleeping around... at ice hotels. Call me *tokig* (Swedish for crazy), but yes, I am a veteran in that regard, as the certificates proudly displayed on my office wall prove: the first, "Moki Kokoris survived the night at the Jukkasjarvi Ice Hotel, temperature: minus 7C°"; and the second, "*Ce diplôme certifie que Moki Kokoris a dormi à l'Hôtel de Glace dans Montmorency, Quebec, à 5C° moindre*" (translation: "This diploma certifies that Moki Kokoris slept at the Ice Hotel at Montmorency, Quebec, in minus 5C°"). I realize that this may not be a big deal to those of you who've spent countless teeth-chattering weeks or months

in exile at frigid polar ice stations, but humor me. I'll bet that few in my audience here have actually slept on cold, hard (yet environmentally safe and fully recyclable) blocks of ice—by choice. And how many of you have eaten reindeer tartare or Arctic char sashimi served on ice plates or had the pleasure of drinking technicolorized vodka out of ice glasses—all

while seated on an ice chair pulled up to an ice table that sits beneath a fiber-optically lit ice chandelier? It's quite a unique and ench-ch-ch-chanting experience, but don't

try this at home.

The concept of the first ice hotel—not counting Inuit igloos—was the brainchild of Yngve Bergqvist, a Swedish entrepreneur who set out to attract winter visitors to a remote yet remarkably beautiful location

*Staying in an ice hotel:
It's quite a unique and
ench-ch-ch-chanting
experience!*



Beverages of one's choice, colored by juice, are served in ice glasses.

approximately 200 kilometers north of the Arctic Circle. It all began in 1989 as a humble 60-square-meter igloo gallery where one could spend the night sleeping in the midst of exhibited works of art. A few years later, Absolut vodka came to shoot their ads there, featuring scantily-clad haute couture models with ice and snow as their backdrop, and the rest is history. These days there is a maze of 80-some rooms that are newly created every year, each with its own theme as embellished and interpreted by artists and sculptors from around the world. There is an indoor cinema, an outdoor amphitheatre, an ice chapel should any tokig couple choose it for their white-on-white wedding with a more “interesting” honeymoon night as the door prize, and outdoors, visitors can stroll through an extensive and ornate ice-sculpture “garden.” Unbelievably enough, the architects and builders also construct a replica of Shakespeare’s Globe Theatre. “To be (cold) or not to be (cold), that is the question.” Truth be told, due to the revival of interest in the Saami culture of Lapland, and because Jukkasjarvi has a Saami cultural center with displays devoted to the wood-carving, shamanistic religion and hunting practices of these indigenous people, the theatre company typically presents an abridged version of “Hamlet” in their native Saami language.

On New Year’s Day, there have been concerts on the ice stage performed by musicians playing on ice instruments! And all of this beneath the ephemeral aurora borealis and star-bespeckled sky. Tokig? Hardly. It is well more than worth every shivering moment. Believe it or not, the Ice Hotel’s waiting list is several years long!

Now, for those visitors whose livers are lilled, there are heated cabins in which to spend the night more conventionally if lying on ice, wrapped like a mummy, covered with reindeer pelts doesn’t qualify as comfy accommodations. Ah, but... if you

are a hardy and courageous soul, and you do manage to fitfully sleep through the night (the frozen drool on your chin notwithstanding), you will awaken to a grinning staff member at your bedside handing you a cup of warm lingonberry tea. Only then do you warrant the official personalized diploma certificate.

All of the components of these buildings are either made of compacted snow or carved out of the exceptionally malleable and perfectly clear ice from the Torne River. This ice is so famous, it has even been shipped to the Saudi desert and shaped into a very temporary ice bar to the brief delight of its drinking camel-commuting customers.

There are many other trivia tidbits I could mention, but the one that seems most intriguing to my listening (and now reading) victims is the purpose of the refrigerator in the Ice Bar. Liquor is served in “glasses” that start out as fist-sized rectangular blocks of ice, a wide hole drilled into each to hold the elixir of choice—Absolut vodka, of course (sorry, beer would freeze)—its manufacturer the main sponsor of the hotel. But clear fluid in clear ice is difficult to see,

... the architects and builders construct a replica of Shakespeare’s Globe Theatre. “To be (cold) or not to be (cold), that is the question.”

so each guest is offered a choice of a juice with which to flavor and color the “water”: orange, lingonberry, lime. These various fruit juices, however, are kept in a real refrigerator built into the snow wall, an extra long extension cord providing power from the building nearby. The fun fact is that the refrigerator keeps these juices *from* freezing—its interior warmer than the ambient air of the room!

Naturally, the growing success and fame of the Jukkasjarvi Ice Hotel provided the incentive for incarnations of it to sprout in other regions of the globe, albeit all on a smaller scale. There is one in Quebec, another in Kangerlussuaq, Greenland, a few in Norway, there is the igloo village in Saariselka, Finland—the most surreal of all, which also boasts the purportedly world’s largest snow restaurant—and now the first American version near Fairbanks, Alaska. And here is another zany trivia bit for your entertainment pleasure: In very early 2004, this United

States ice hotel—the Aurora Ice Hotel at the Chena Hot Springs Resort—was literally and figuratively frozen in its tracks during its construction. State officials cited the hotel’s owner for fire code violations and did not permit the building to open until smoke detectors and fire extinguishers had been installed in each room (I’m not kidding. Only in America!). Although the initial structure melted in the spring of 2004, it was rebuilt for the 2005 season, this time inside a larger, refrigerated structure—with the goal of keeping it frozen and habitable year-round. Did I mention “only in America?” This particular OSHA-esque snag aside, the expanding plethora of stock-still H₂O structures to slumber in just makes one want to, à la Goldilocks, try out all of the ice beds for comfort and hardness levels, doesn’t it? Let’s not all answer at once, shall we?

Still, as would be human, we often try to not only emulate but improve upon Mother Nature and on ancient tried-and-true practices by applying contemporary design to them. Much as we invented metal objects with sheet-metal wings to fly in, we have also invented aluminum igloos to sleep in. The proof speaks for itself on the shores of Disko Bay in the outskirts of Ilulissat, Greenland. So, for that super special summer igloo experience, guests can enjoy all the comforts of home in melt-proof igloos that look somewhat like shiny UFOs that ran out of fuel, rendering them permanently stationed on planet Earth.

With the exception of the latter alloy domes, come spring with its warmth and longer days, each of these ice hotels slowly melts back into the rivers from which it was created, leaving little trace of its frigid transient existence.

Tonight, as you retire to a blissful night’s rest in a cozy and warm, soft bed, I ask you: Could *you* in your bedrooms ever be able to gain enough expertise to author the next *New York Times* bestseller—namely, the “Sleeping on Ice for Dummies” training manual? It may not be high on your respective to-do lists, but if you don’t mind, I would like to try for that honor by continuing to subject myself to slightly less hospitable sleeping conditions whenever possible. And I confess, there always has been a highly personal ulterior motive to these icy nights I subject myself to. You see, this is why—in spite of my true biological age—I still look <cough> so young. Refrigeration is an excellent preservative. Who needs Botox?! □

A Footnote to Arctic History: Two Birds On Ice

by John Seamands

The Naval Arctic Research Laboratory (NARL), located at Barrow, collaborated with the University of Alaska in operating a scientific research station on a floating slab of freshwater ice known as T-3, or Fletcher's Ice Island. This slab had broken free from a floating ice sheet off Ellesmere Island in the Canadian Arctic in 1945 or 1946. The durable berg hosted many U.S. scientific projects after its first occupation in 1952, and circled the Arctic in the Beaufort Gyre at least five times. Finally the Transpolar Drift caught T-3 off Wrangel Island and expelled into the North Atlantic in 1983 (Althoff, W., 2007. *Drift Station*, Potomac Books, pp. 67-69; 219-220; 286).

By the early 1970s, T-3 had drifted back near its origin off Ellesmere Island, far from Alaska. Accordingly, the University of Alaska had contracted Alaska International Air, Inc. (AIA) of Fairbanks to supply the floating island with flights that required a stop at Barrow before proceeding to T-3. On scheduled resupply flight days, the coordinates of the island and runway heading were relayed to AIA because the island was constantly moving along in the drifting pack ice that surrounded it. T-3 was then roughly seven miles in width and one hundred feet thick. Five hours was the average flight time from Point Barrow and the distance from Fairbanks was over 1600 miles. Over-water flights of that length required a navigator to maintain a track to the destination. A radio beacon was located on T-3, but the signal was not strong enough to guide a Lockheed Hercules flying at 20,000 feet along the entire route.

On the morning of February 28, 1973, Captain Jerry Chisum and his flight deck crew departed Fairbanks International, flying Hercules N921 NA ("921" for short), for the flight to NARL. His flight crewmembers were copilot Ron Bergt and flight engineer Jim Fitch. At NARL, the crew oversaw the loading of supplies and fuel for the round-trip flight and were briefed on the latest position

of the island and weather conditions.

Their flight to T-3 was routine. Scenery consisted of constantly changing configurations of pack ice when haze permitted a view of the surface. On descent, the Automatic Direction Finder (ADF) needle was guiding the crew steadily toward the radio beacon, when T-3 was spotted, surrounded by rough sea ice. The island appeared as a large white expanse and then the snow-covered runway and camp buildings came into view. Captain Chisum called for flaps 50 and maneuvered 921 to align with the runway, gear down, final flaps and the landing checklist was complete. The runway appeared to be smooth on

aircraft could be conducted on-site. Their verdict was that the aircraft could fly again if repairs were made to the damaged left wing and if AIA could procure and install a wing center-section. AIA sent top-notch maintenance man, Art Walker, and his crew to T-3, where they would be busy for eight months. The insurance company had declared the aircraft a total loss and compensated the company. Later, AIA bought the Herc (921) from the insurance company.

T-3's runway normally was closed to all aircraft between mid-June and mid-September due to degradation of the runway by summer melting. It was thus important to schedule flights promptly to transport the damaged left wing to and from Fairbanks, and to move equipment and critical replacement parts to T-3.

In June 1973, AIA purchased a wing center-section from the U.S. Marine Corps at Cherry Point, North Carolina. On June 6, another AIA Hercules, N13 ST, departed Fairbanks for the Atlantic coast, flown by Captain Ray Wells, with myself as copilot and flight engineer Harold Inman. Our aircraft departed Cherry Point on the morning of June 8 for the flight to Churchill on Hudson Bay for an overnight stop. The 6 ½-hour flight to T-3 departed at 6:16 am on



AIA C-130 Hercules, N921 NA, where it came to rest alongside the airstrip on Ice Island T-3, after impact on landing that broke its main wing spars. Outboard engines, #1 and #4, and this airplane's left wing were also heavily damaged. This photo was taken by Larry Underwood on 1st March 1973. John Seamands copiloted N613 ST, when it had a less serious mishap on this airstrip in June 1973. Both aircraft were repaired on the ice, flown off T-3, and returned to full service. Photo, courtesy of John F. Schindler, former Director of the Naval Arctic Research Laboratory, Barrow, Alaska.

short final. On touchdown, 921 encountered undulations in the runway's surface severe enough to threaten the aircraft's safety. Captain Chisum found that the airspeed was insufficient for go-around. The main landing gear struck one hummock with enough force to cause the wings to fail at the center-section. The two outboard propellers (#1 and #4) separated from their engines. There was no fire and crewmembers were restrained by seat belts and shoulder harnesses so they were fortunately uninjured. AIA had not been advised of the poor runway condition prior to the flight. Later, Canadian Ministry of Transport investigators absolved the flight crew of responsibility.

Lockheed engineers were flown to T-3 to determine whether necessary repairs to the

June 9, and was scenic and uneventful as we over-flew Canada's Arctic islands. Approaching T-3, Ray turned on final approach and touched down on the snow-covered runway and taxied to the far end where the damaged 921 was parked.

The sun was bright and the day felt especially warm while our Herc's cargo for the repair operation on T-3 was unloaded. The mountainous terrain on Ellesmere Island was visible on the horizon. In late afternoon, it was finally time to start engines and taxi for departure for our distant Fairbanks destination. While turning around to align the aircraft for takeoff, the right main landing gear suddenly sank into melt-softened snow up to the gear door. Number four propeller struck the runway. The fire warn-

ing light for the engine illuminated briefly and then went out. The propeller had separated from the engine; it spun toward 921 and some bystanders, but stopped short just in time. Fearing fire, I jumped out with an extinguisher. I found that the engine propeller gear box was gone and most of the engine was missing, so there was nothing left to burn.

AIA now had two Hercules aircraft disabled on T-3, of its fleet of five cargo planes. The company's overseas operations were in full swing in Africa, the Mideast and Europe, so two mishaps on T-3 represented a serious dent in operational capabilities. Resourceful mechanics moved N13 ST's number three engine outboard, into the number four wing position and then faired over (streamlined) the nacelle where the engine had been removed. While the repair work progressed, a small cat and a grader groomed the runway further to create a firm surface for takeoff.

It took one week to prepare the runway and make the three-engine Herc airworthy. We ferried N13 ST home at reduced speed, with required fuel stops. Later this aircraft was flown to the factory for inspection and then returned to service.

The more extensively damaged N921 NA returned to Fairbanks on Thanksgiving Day 1973. Captain Jerry Chisum and his crew were honored to fly it home. A large celebration had been prepared for their arrival. Maintenance chief Art Walker was awarded a month-long vacation in Hawaii (*Fairbanks Daily News-Miner*, November 1973).

N921 NA was also flown to the Lockheed factory in Georgia for inspection, where factory engineers declared that wing repair work on T-3 was first-class and the wing center-section was correctly aligned. The work on T-3 had been completed under harsh weather conditions using basic equipment. □

Researchers Seek to Demystify Metabolic Magic of Sled Dogs

New York Times, 6 May 2008, by **Douglas Robson**—When humans engage in highly strenuous exercise day after day, they start to metabolize the body's reserves, depleting glycogen and fat stores. When cells run out of energy, a result is fatigue, and exercise grinds to a halt until those sources are replenished.

Dogs are different, in particular the sled dogs that run the annual Iditarod Trail Sled Dog Race in Alaska. This is a grueling 1,100-mile race, and studies how that the dogs somehow change their metabolism during the race.

Dr. Michael S. Davis, an associate professor of veterinary physiology at Oklahoma State University and an animal exercise researcher, said: "Before the race, the dogs' metabolic makeup is similar to humans. Then suddenly they throw a switch—we don't know what it is yet—that reverses all of that. In a 24-hour period, they go back to the same type of metabolic baseline you see in resting subjects. But it's while they are running 100 miles a day."

Dr. Davis, who studied the sled dogs, found they did not chew up their reserves and avoided the worst aspects of fatigue. He is pursuing the research for the Defense Advanced Research Projects Agency, which gave him a \$1.4 million grant in 2003 to study the physiology of fatigue resistance of sled dogs.

Dr. Davis, who is teaming with researchers at Texas A&M in a \$300,000 Darpa grant, awarded last fall, has been traveling to Alaska for years to learn why the sled dogs are "fatigue-proof."



Sled dogs somehow change their metabolism in a race.

"They have a hidden strategy that they can turn on," he said. "We are confident that humans have the capacity for that strategy. We have to figure out how dogs are turning it on to turn it on in humans."

Researchers have not demonstrated that ability in other species, but Dr. Davis said migratory mammals or birds could have it. Nor is it similar to the mammalian diving reflex that lets aquatic mammals like seals, otters and dolphins stay under water for long periods of time by slowing metabolic rates.

"The level of metabolism is staying the same," Dr. Davis said. "It's not slowing down their calorie burn rate."

In fact, sled dogs in long-distance racing typically burn 240 calories a pound per day for one to two weeks nonstop. The average Tour de France cyclist burns 100 calories a pound of weight, daily, researchers say.

How the dogs maintain such a high level of caloric burn for an extended period without tapping into their reserves: of fat and glycogen (and thus grinding to a halt like the rest of us) is what makes them "magical," Davis says.

If Dr. Davis and the Texas A&M searchers identify the biomarker, "switch," that could help the military understand and develop ways to control and prevent the physiological effects of fatigue in strenuous cases like combat.

"Soldiers' duties often require extreme exertion, which causes them to become fatigued," Jan Walker of Darpa wrote in an e-mail message. "Severe fatigue can result in a compromised immune system, making soldiers more susceptible to illness or injury." □



Oldest Polar Bear Dies at 42

Associated Press, WINNIPEG, Manitoba, 18 November 2008—Debby, the world's oldest living polar bear, has died at age 42 at the Assiniboine Park Zoo in Winnipeg, Canada. She was euthanized on November 17 after suffering several strokes and experiencing organ failure.

Debby was born in the Russian Arctic in 1966 and arrived in Winnipeg as an orphan a year later. She was added to the Guinness Book of Records earlier this year as the oldest living polar bear at age 41. "She was without doubt the most famous animal in the Assiniboine Park's zoo's 104-year history," said Gordon Glover, the zoo's coordinator. "She will be missed," he said. □

General David L. Brainard, U.S. Army (Part Two)

Last survivor of the United States' Lady Franklin Bay Expedition (1881-84)

(This is the 2nd and last installment of this article by Mr. Stein, continued from our July 2008 issue.)

by Glenn M. Stein, FRGS

Spring Sledging 1882 and a "Farthest North" Record

A sledge party under Dr. Pavy was dispatched to northern Ellesmere Island, to determine if land existed further north of the island, and encountered huge icebergs and enormous hummocks. The ice floes behind the party separated and the men retreated for fear of being marooned.

Greely set out from Fort Conger to explore the island's interior and discovered a large lake, which he named after General Hazen, Chief of the Signal Corps.

On 4 April 1882, the North Greenland Sledge Party departed with Lieut. Lockwood in charge, and Sgt. Brainard as Second-in-Command. It was organized into two parties, taking the sledges *Hayes*, *Kane*, *Beaumont*, *Hall* and the dog sledge *Antoinette* (named after Greely's daughter). After six days, the sun was with them constantly, day and night, and there was much suffering from snow blindness. Temperatures sometimes struck 50° below zero, and the men were exposed to chilling blasts that swept down from the north as they hugged the Greenland coastline.

On 29 April, the support party turned back, while Lockwood, Brainard and Greenland Fredrick Christiansen, with a single dog sledge and 25 days' rations, forged onward alone—and were about to make history. It was hard going over crusty ice and around huge hummocks. The total weight of their load was 783 pounds, including sledge—nearly 98 pounds per dog. At times, Brainard stumbled about like a blind man: "We have snow glasses, but seldom wear them. They make the ground appear uneven."

The trio soon surpassed the furthest point achieved by Lieut. Beaumont's Greenland sledge team during the 1875-76 British Arctic Expedition, whose maps greatly assisted the Americans. On May 6, Brainard wrote about the unknown coast: "Travelling abominable. Our route leads us along the tidal crack which varies in width from one to one hundred yards...camp at 11:15 P.M., having travelled ten hours. Men and dogs both worn."

Afterward, a severe snowstorm slowed progress to the point where the party had to camp on an island for 60 hours—a loss of time it could ill afford. On 13 May, the storm

moderated and the advance was resumed through deep snow and pack ice, past capes and fjords. Finally, on that day, a new "farthest north" record was set at latitude 83° 24'N and longitude 40° 46'W—beating the record held by British Commander Markham in 1876 and surpassing 300 years of British Arctic record-breaking. Brainard recorded the moment:

From observations taken along route, we believe we are in a higher latitude than ever before reached by man, and on land farther north than any was thought to exist. Once again we ran up the Stars and Stripes, this time with a feeling that warmed our spirits despite the northern breeze which swirled around us.

A flag-topped stone pyramid nine feet high was erected, containing a tin cylinder with expedition records and a self-recording spirit thermometer. Observations were taken and geological and botanical specimens collected, but Brainard marked the historic occasion in a uniquely American way. Anywhere he visited in the U.S., even in the remote areas of the Rocky Mountains, he found "Plantation Bitters" conspicuously advertised. Consequently, he carved "St 1860 X" [started trade in 1860 with ten dollars] on a slab in the face of a cliff. When he told Lieut. Lockwood of what he had done, Lockwood laughingly said he was sure Brainard was a company employee and that he would expect to be paid in bitters for his work!

Brainard and his companions left a "scene [that] was grand and impressive beyond description," which included the later-named Lockwood Island and Brainard Island, and headed home. The three explorers reached Fort Conger on 1 June, having been absent 59 days and traversing nearly 1,100 miles, mostly in temperatures well below zero. Lieut. Greely came out specially to greet the party.

The Relief Ship and a Second Winter

Summer excursions were made to the westward, across Grinnell Land, Ellesmere Island's interior. The landscape came alive with newly discovered lakes, rivers, glaciers and mountains. In order to supplement the station's food supply, much hunting was also carried out.

Besides the excursions, there were routine

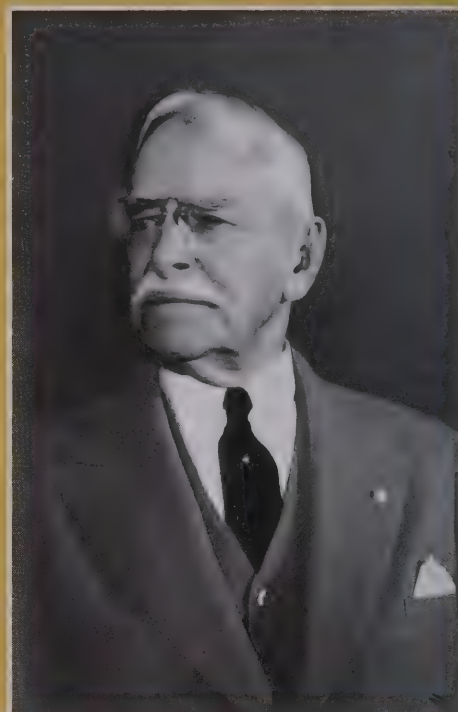


PHOTO BY CAPT. STEPHEN WATERMAN

Brigadier Gen. David L. Brainard at age 87, April 1944.

duties and a good deal of time spent writing letters to send back home on the expected relief ship. Though equipped with ample food and clothing for a two-year stay at Lady Franklin Bay, a vessel bringing new personnel, additional supplies and mail was due to arrive at Fort Conger during the summer of 1882. The expedition had come through the first winter in good health and spirits and the future looked bright.

By September the relief ship *Neptune* was turned back by the ice in Smith Sound, 300 miles from Fort Conger. She depoted enough rations at Cape Sabine (Ellesmere Island) to feed Greely's party for ten days and an equal amount at Littleton Island (Greenland side). This caused no immediate hardship for the well stocked expedition, but the novelty of Arctic exploration had worn off for the men who were due to return home, arousing tension, dissatisfaction and insubordination.

Greely's relationships with Dr. Pavy and Lieut. Kislingbury, never good, grew worse during the winter. No one had spent two winters so far north and the long months of darkness chafed on everyone, even Brainard, who were much affected by the idleness.

Spring Sledging 1883

Lieut. Lockwood, Sgt. Brainard and Greenlander Frederick, with a team of the ten best dogs, set off to the southwest on 25 April, across Grinnell Land toward the Western Ocean. It was the last extended sledge journey for the expedition before the relief ship was expected in the summer.

A week later, while scouting, Brainard climbed some cliffs south of camp. "The view was worth the climb," he wrote. "I saw a magnificent panorama of imposing snow-clad mountains and sweeping hills intersected by valleys and ravines."

Dashing on, the intrepid explorers crossed the island for the first time from the east to the Western Ocean and saw marine fossils and petrified trees. Along the way, they discovered an 85-mile long glacier subsequently named Agassiz Glacier. They also discovered and named Greely Fjord and two headlands north and south of the fjord became Cape Brainard and Cape Lockwood.

The party returned to Fort Conger by 26 May. In the process of charting large areas of Grinnell Land, Lockwood, Brainard and Greenlander Frederick had completed all three "farthest" during the Lady Franklin Bay Expedition—north, east and west. They had journeyed on foot and by sledge one-eighth of the distance around the world above the 80th parallel. Greely radiated with praise and reserved a special honor for Sgt. Brainard:

Sergeant Brainard's share of this work showed the same sterling qualities evinced by him the previous year, and in consequence he was recommended by me in 1882 for a commission in the Army.

Mutinous Retreat

Through the summer months, hopeful eyes scanned the empty horizon south of Fort Conger for the relief ship. Greely would have liked to send home certain undersirables, like Sgt. Cross, the steam launch's engineer, but he was indispensable as a skilled mechanic. One time, Cross got drunk from stolen spirit lamp fuel and fell from the launch. He would have drowned if it were not for Brainard, who hauled him out of the freezing water.

But what if the relief vessel failed to reach the outpost? Before leaving the United States, Greely worked out a detailed plan whereby the party would retreat south if the relief ship did not arrive. A string of depots planted along the Ellesmere coast by the *Proteus* when she brought the party north in 1881 would keep it supplied with food and enable

the boats to carry minimum loads. A relief ship would be waiting for Greely at the most northern point allowed by the pack ice, but if not, a relief party would camp at Littleton Island (Greenland side) with food and clothing, to keep contact between the two parties throughout the winter. Everyone was to be picked up in the spring. It was a sound plan, if, in Brainard's words, "nothing upset the scheme [Greely] had meticulously worked out for an independent retreat southwards."

On 9 August 1883, the 300-mile retreat began. "I was the last to leave the station and nailed the door securely," wrote Brainard. Unknown to anyone, two weeks previous, the *Proteus* was crushed by the ice far to the south. Though some food and supplies were depoted ashore, the ship went down with most of her valuable cargo—rescue did not await the men of the Lady Franklin Bay Expedition.

Greely was in charge of the steam launch *Lady Greely*, which towed the other boats: Rice commanded the jollyboat *Valorous*, Connell the iceboat *Beaumont* (both left by the British expedition) and Brainard the whaleboat *Narwhal*. Each officer was allowed 16 pounds of personal baggage and each man only eight pounds. Scientific instruments and accompanying records were carefully packed and stowed.

On the 13th, the party's passage down Kennedy Channel was blocked by a huge grounded floeberg that ran a mile out from shore. It had split, leaving a cleft scarcely 12 feet wide, 50 feet high and more than 100 yards long. As the boats passed through the blue-green ice tunnel, the men could hardly help but be impressed with the natural corridor.

Greely was no sailor, he was feeling his way—and his men knew it. As the party plodded southward the ice weather terrorized them all the way, keeping them away from the depots ashore. Greely wrote, "Our progress shows the decided advantage of detailing Brainard to select the route."

During the course of the retreat, Brainard became more and more concerned over Greely's distraught frame of mind. At one point, Greely proposed to abandon the steam launch, put the boats and supplies on the drifting ice, and float south with the current to Littleton Island. To Brainard the idea seemed sheer madness. Cross wrote, "The way things look, if C.O. has his way, we will wind up like Franklin." Brainard feared the same.

Dr. Pavy submitted a grave proposal to Brainard on behalf of some of the others.

If Greely decided to go through with his planned "drift," the doctor would declare the commander of unsound mind, and Lieut. Kislisbury would take command and lead the party back to Fort Conger and retreat again next spring. The senior non-commissioned officer's support for the mutiny was crucial to secure the allegiance of the enlisted men. Gauging the characters of the men who planned the mutiny, Brainard refused to support the plan, which he could only see as a breakdown in discipline, thus putting the party in even greater danger.

By mid-September, the *Lady Greely* and *Valorous* were abandoned and there began a tortuously meandering 34-day drift on the ice. The men were all feeling hunger now and there was only a forty-day supply of rations left. As stoic as he was, Brainard was not optimistic:

The roar of the moving and grinding pack east of us in the axis of the channel is something so terrible that even the bravest cannot appear unconcerned. To add to this scene of desolation, dark, portentous clouds hang over the horizon to remind us that our floe is not connected with the land, but drifting helplessly in the Kane Sea.

It was not until 29 September that the party reached terra firma once more at place across from Littleton Island. Greely named the spot Eskimo Point, after the discovery of three ancient igloos. Any rejoicing was short-lived. Continuing discipline problems and worsening food shortages caused Greely to take a still firmer hand with his men. As First Sergeant and Commissary Sergeant, an even heavier burden was placed on Brainard's shoulders.

Winter at Cape Sabine, 1883-84

A hunting party discovered a note left by the leader of the *Proteus* relief expedition in late July, indicating that some depots of food and supplies were left in the Cape Sabine area. In spite of the good news, Brainard was coldly realistic:

There are little more than 1,000 rations at Cape Sabine and these will not go far toward feeding twenty-five men. Little time remains to hunt and besides game has become noticeably scarce.

In early October, Greely predicted a dark future:

I, however, am fully aware of the very dangerous situation we are yet in, and foresee a winter of starvation, suffering and probably death for some... Our fuel is so scanty that

CONTINUED ON PAGE 18

we are in danger of perishing on that score alone. Am determined to make our food last until April 1, and shall so divide it, supplementing it from any game killed.

Entailing heavy sledge work, the party moved to Cape Sabine, as the thermometer steadily moved from zero degrees Fahrenheit to 13 below—and falling. Cape Sabine was several miles to the northeast, and there the men constructed a stone house for the winter. With a upturned boat for a roof, it was christened Camp Clay and measured only 25 X 18 feet, by four feet high.

Constant hunger was now their companion. Throughout the coming months, the men's spirits and energy dwindled. Brainard noted that, "No one ever thinks of wasting what energy he has in cleaning his person, or fussing with his ragged garments." Worse, food was being stolen from the commissary storehouse. More than once, angry accusations flew from long-bearded faces, blackened by soot from the cooking fire. The Commissary Sergeant tried to set a spring-gun trap on the storehouse door, but had so much trouble setting the gun that he gave up the attempt.

The party engaged in storytelling to pass the time and Brainard told tales of fighting Indians, but nothing could really take their minds away from the hunger tearing at their stomachs. There were continual brave attempts to supplement the meager food supply by hunting, with varying success.

The first death in the Lady Franklin Bay Expedition occurred on 17 January 1884, when Cross died of starvation. The next morning Brainard and fellow Second Cavalryman Pte. Biederbeck wrapped the corpse in empty coffee sacks with as much tenderness as they could manage and draped the American flag over the body. A six-man detail pulled the body on a sledge to what would become Cemetery Ridge, some 50 yards from camp. Due to the frozen, rocky earth, the grave was only 15 inches deep. Brainard recorded the scene:

One cannot conceive of anything more unearthly, more weird, than this ghostly procession of emaciated and half-starved men moving slowly and silently away from their wretched ice-prison in the dim and uncertain light of an Arctic night, having in their midst a dead comrade who was about to be laid away in the frozen ground forever. It was a scene that one can never forget.

In spite of their privations, only one man died that winter, but scurvy was also among them.

Fatal Spring

With the coming of spring, Brainard lifted the mood of the entire party when he came into camp on 14 March with three ptarmigan he had shot—the first game since a scrawny fox was killed in February. Viewed as a good omen, the men started to formulate ideas to increase the food supply and Brainard acted on a proposal Greely had made some time before by rigging a cloth net to catch tiny crustaceans, about the size of wheat grain and referred to as "shrimps." Both Brainard and Sgt. Rice made use of the rig in a tidal crack.

But there was a killer lurking about Camp Clay. One morning in late March, men started collapsing in the hut, and it was quickly realized that fumes from the alcohol lamp used to heat tea had poisoned their air supply. Someone snatched away the rags that had been stuffed the night before into the ventilation hole above the cooking place as everyone tumbled outside into the -24°F weather, taking deep gasps of the fresh morning air. It was a very close call.

Though the food supply moderately increased, by 2 April, Brainard wrote that "everybody is ravenously hungry, and all are growing daily weaker." Then, three days later, Greenlander Frederick died after several days of extreme weakness. The next day, another man died, and then Lieut. Lockwood. Brainard noted a change that had come over the party:

Our own condition is so wretched, so palpably miserable, that death would be welcomed rather than feared...

On 14 April, Greely wrote in his journal that Brainard was to succeed him in command of the expedition should anything happen to him. On 22 April, Greely added, "I gave Sgt. Brainard instructions about my effects &c. if anything should happen to me. I want Brainard commissioned." The stalwart Sergeant was making two and three trips a day to the tidal crack to secure "shrimps" and often returned to camp dizzy and staggering. He earned an officer's commission many times over.

Death stalked the expedition and seized Greenlander Jens Edward, who drowned in his kayak while recovering a seal. Also, there were more accusations and counter-claims of stealing food. Four men died in May, leaving just 14 remaining. Towards the end of the month, the hut was abandoned in favor of a tent for the coming summer.

At times, Brainard was much injured by the actions of his comrades, one example being on 29 May, as recorded by Greely:

Brainard returned exhausted and half-frozen from his shrimping trip, and was obliged to sleep outside the tent in the storm, as Dr. Pavy and Salor, who are in Brainard's bag, crowded him out, refusing to make room for him inside. Brainard took the matter very quietly, although in his weak condition he suffered greatly from cold and exposure.

Summer: Death and Salvation

Pvt. Henry had been warned more than once about repeatedly stealing food and on the evening of 5 June, Greely quietly handed Brainard a page torn from his pocket notebook. It was an order to shoot Henry if he was again caught stealing food. Henry was caught dipping into the shrimp pot at next morning's breakfast, and when confronted, boldly admitted his crime without the slightest repentance. Greely then wrote a new order to Sergeants Brainard, Long and Frederick—execute Pvt. Henry. He wrote in part, "This order is *imperative and absolutely necessary* for any chance of life." The three executioners drew lots as to who would fire the shots, as there was only one suitable rifle in camp, and swore never to reveal the man's name. Henry then paid the ultimate price for his crime.

In spite of the dire circumstances, Brainard still took an interest in his surroundings. On 8 June, Greely penned that Brainard "...found yesterday a few Eskimo relics. We told him it was a ruling passion strong in death, as he has always been gathering up articles of that kind." The bone knife in this Collection was evidently acquired in this manner, with the dark blue spotting most likely coming from ink from the printing press at Fort Conger.

By 22 June, just seven men remained from the Lady Franklin Bay Expedition, one of whom had long since lost both feet and had only shriveled and useless fingers due to frostbite. Greely thought he heard a ship's whistle and asked Brainard and Long to investigate. Having crawled up the ridge, the men saw nothing and Brainard returned to the tent to report to Greely. Long went up to the knoll to raise the fallen signal flag Brainard had planted there some weeks before, and as he gazed out into the water, he could just make out the form of a ship—they were saved!

Soon, Navy Lieutenant John C. Colwell and others were at the camp. Brainard immediately drew himself up to the "position of the soldier" and was about to salute, when Colwell gently took his hand. At the time of rescue, the men were within 48 hours of death, and it was largely due to Sgt. Brainard's scrupu-

lous handling of food supplies and his shrimp fishing that anyone was still alive. During the dreadful winter months, “no ounce of unauthorized food passed his lips,” wrote Greely about his valiant First Sergeant.

Bodies of the dead were exhumed by the rescuers from shallow graves on Cemetery Ridge and it was discovered that six had been cannibalized. This discovery and the failed relief missions caused a public sensation in the United States, but to their dying days, all of the survivors denied any knowledge of cannibalism.

In the end, only six remained of the 25-man Lady Franklin Bay Expedition, with the severely frostbitten man having died on one of the homeward bound rescue ships.

Interestingly, Brainard first received recognition for his Arctic achievements, not from his own countrymen, but from the Royal Geographical Society in June 1886, which presented him with the Back Grant. The award included a gold testimonial watch and diploma. In his letter to the Society, Brainard generously acknowledged that Beaumont’s “maps, sketches, and clear comprehensive descriptions” were key to Lieut. Lockwood’s party attaining the highest northern latitude. Greely received the RGS Founder’s Gold Medal.

Sgt. Brainard was finally rewarded with a commission in his old unit, the Second Cavalry, that October, “As recognition of the gallant and meritorious services rendered by him in the Arctic expedition of 1881-1884.” At that time, and for many years thereafter, he was the only living officer of the Army, active or retired, holding a commission awarded for specific distinguished services.

By the early 1890s, Brainard was promoted to First Lieutenant, and during this period, several troops of the Second Cavalry (the designation changed from “company” in 1881) were in the field searching for the Apache Kid, a former U.S. Army Indian Scout who had been a renegade for many years. Other detachments were in constant search of hostile Indians who were guilty of isolated plunderings. What eventually happened to the Kid is a mystery, but he likely made it to Mexico and died there.

In spite of becoming an expert marksman, Brainard’s sight was affected by his eye wound from the Sioux War and snow-blindness in the Arctic. This likely caused his transfer to a branch for which he was well-suited—commissary and subsistence—where he became a Captain in 1896.

Brainard rose steadily in rank and saw ser-

vice during the Spanish-American War, Philippine Insurrection and as the Military Attaché in Buenos Aires and Lisbon during the First World War. He eventually retired as a Brigadier General in 1919. After his military retirement, Brainard became the Washington representative for a New York business firm, the Association of Army and Navy Stores, of which he was Vice President and a Director.

Belated Recognition and Remembrance of Arctic Service

By the 1920s, Greely had long since retired as a Major General, but he and Brainard had stayed in close contact since their Arctic days. After four decades, the American Geographical Society recognized Brainard for his “conspicuous work in the field of Arctic exploration” and awarded him the Charles P. Daly Medal in 1925. Greely wrote to the Society’s secretary about Brainard with great pride: “As an American soldier his extraordinary services and unswerving fidelity during the fateful winter at Cape Sabine preserved lives, maintained solidarity, and eventually led to the preservation of the records of the first scientific cooperation of this country.” Unfortunately, the whereabouts of this gold medal are unknown.

In April 1922, Brainard served as one of three Explorer Club’s representatives invited to the unveiling of the Peary Memorial in Arlington National Cemetery; by this date, only Greely and Brainard remained of the six Lady Franklin Bay survivors.

In June 1925, another moving unveiling also took place at Cape Sabine, honoring the dead of the Lady Franklin Bay Expedition, when the National Geographic Society’s Memorial Tablet was affixed to a 100-ton boulder. A few months later, Greely (on the Board of the N.G.S.) wrote to Brainard, a Society member:

I have sent a letter to Shea stating that I am in accord with him at Pearys farthest North. At a proper time I hope you will express your opinion. I do not question Peary's truthfulness, but I do his accuracy. You are the best informed man alive who can pass from personal experience of the wonderful marches that P thought he made. It is an impossibility in my judgement.

At the close of the decade, The Explorers Club presented its highest honor, the Explorers Medal, to the only survivor of the “farthest north” sledge party at the Annual Dinner on 12 January 1929. The award is the organization’s highest honor bestowed and is awarded

for extraordinary contributions directly to the field of exploration, scientific research or to the welfare of humanity. Perhaps influenced by the recent recognition, in the same year, Brainard published *The Outpost of the Lost: An Arctic Adventure*, a transcription of the last 11 months of his journal, which had lain for 45 years in an old trunk.

The Last Survivor

Brainard’s final polar accolade came in 1936, the year after Greely’s death, when the American Polar Society elected Brainard its first Honorary Member on his 80th birthday. A few days before Christmas, Marie Peary (the explorer’s daughter) was on hand to present a specially illustrated scroll, signed by Paul A. Siple (Society president and veteran of two Antarctic expeditions under Byrd). And the media sought out Brainard too; in the 1930s and into the ’40s, he retold the story of Arctic adventure for newspaper readers and radio audiences alike.

The last survivor of the Lady Franklin Bay Expedition published a transcription of his journal for the entire expedition in 1940, under the title *Six Came Back: The Arctic Adventure of David L. Brainard*. One *New York Times*’ book reviewer wrote, “It is easy to understand why this diary was withheld from publication until both Brainard and Greely were dead.” The General wrote to the newspaper that “...he is very much alive and expects to be for some time to come and asks that we take immediate steps to restore him to a living status through the same medium that deprived him of life.” The *Times* was very glad to comply with such a request.

On an additional lighter note, in October of that same year, a Mrs. Lillian Gary Taylor wrote to Brainard, asking him if he remembered the afternoon, many years ago, when she was a sixteen-year-old girl and christened the expedition’s launch. In his jovial reply Brainard wrote, “I recall every incident of the christening of the launch, Lady Greely, and I specially remember the charming young girl whom Lockwood had asked to do the christening. I have never forgotten the champagne, as it was the last that I drank for over three years.”

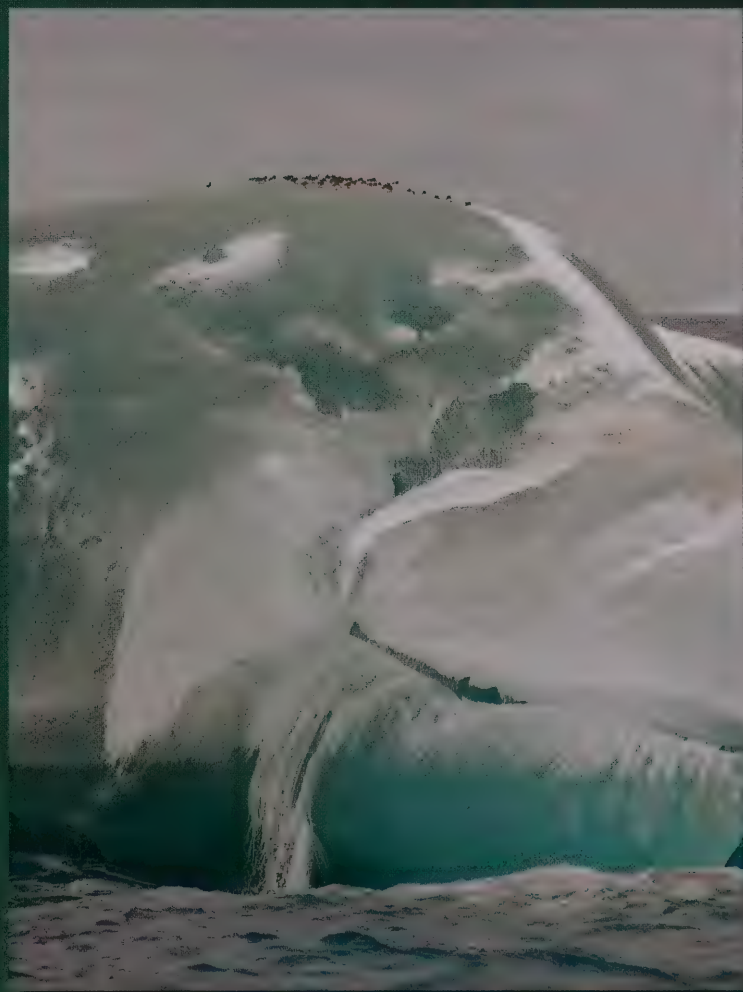
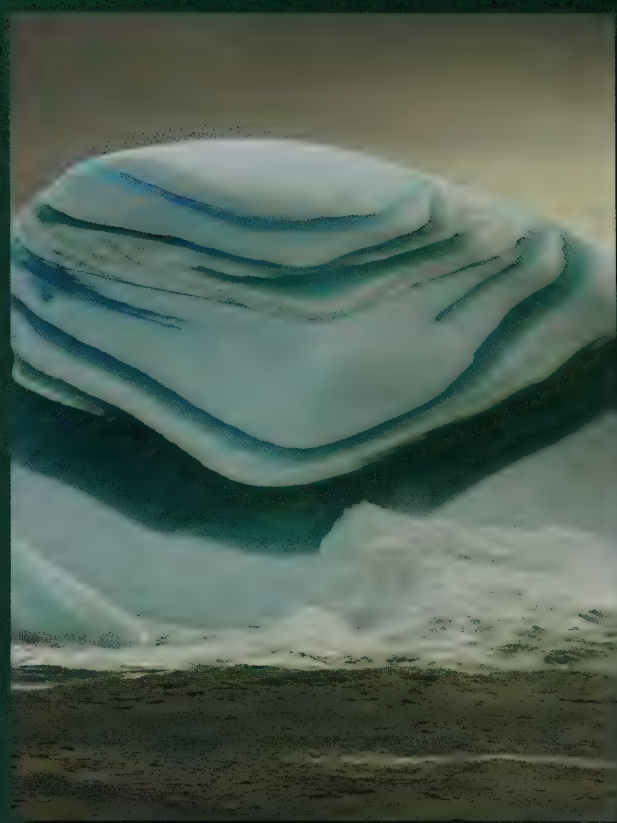
David L. Brainard remained active in business up until his death of a heart attack in Washington’s Walter Reed General Hospital, on 22 March 1946; Sara Hall Brainard died in 1953, and both were laid to rest in Arlington National Cemetery. Elinor passed away in New York City in 1982. □

More Bergs of a Different Stripe

In response to our short article, "Bergs of a Different Stripe," in our last issue, wherein we queried whether the fantastic striped berg photos we had in hand were true-to-life or "Photoshopped," Mr. Steve Nicol, a senior Australian scientist, kindly provided the photographs you see on these pages—proof irrefutable that, indeed, there are many, many bergs of a different stripe!

Be sure to read Mr. Nicol's related article on the following pages.





"And ice, mast-high, came floating by, as green as emerald" —* **The Crystalline Distractions of the Southern Ocean**

by Steve Nicol, Australian Antarctic Division



Author Steve Nicol poses with one of East Antarctica's "chief scenic delights"

Long oceanic research voyages are rarely organized with scenery in mind. Polar oceanography, however, can offer exceptional sights, because the normally featureless blue ocean is often interrupted by icebergs and, as one approaches the Antarctic continent, by sea ice and the wildlife associated with this highly productive zone. In addition, the extremes of light that are a feature of the Southern Ocean—the endless sunsets and sunrises—create considerable opportunities for distraction from scientific work.

I have participated in eight long scientific research voyages to the waters off East Antarctica over the last 20 years and I am constantly surprised by how much the ever-changing scenery of the Southern Ocean still draws my attention. In recent years, the type of research that I have been involved in requires that the vessel steams a series of transects perpendicular to the Antarctic coastline collecting data and occupying scientific stations as it goes. The two largest of

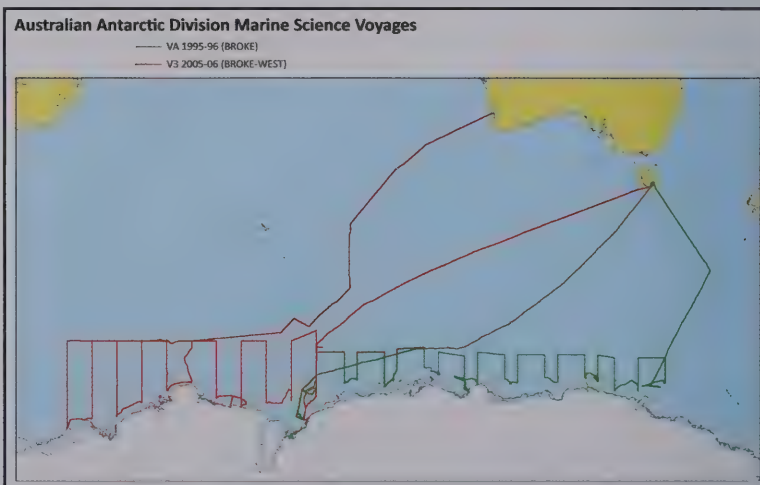
these surveys covered a vast area of the Antarctic coastline between 30°E and 150°E, and made a total of 29 meridional transect lines (see illustration).

The goal of these voyages was to describe the regional oceanographic and ecological features as well as to estimate how much Antarctic krill was in the area so that catch limits could be established for the krill fishery. The East Antarctic coastline may not have the dramatic topography of areas such as the Antarctic Peninsula but it still provides a range of stunning scenery including ice shelves, embayments, mountains, rocky outcrops and promontories. Much of this coastline is also rarely visited, which adds a frisson of exploration to the ven-

ture. The zig-zag voyage track also provides an ever-changing environment, from the broad vistas of the open ocean to the majesty of iceberg fields close to the coast. Most of the scientific observations occur on the meridional transects, so the West-East transits between the sampling lines provide a chance to catch one's breath and, particularly at the southern ends, to conduct some modest tourist activities.

Chief among Antarctica's scenic delights are icebergs. The distribution of icebergs around Antarctica is a product of where they are formed, and of the water currents that move them. Icebergs calve from glaciers and break free from great ice shelves. East Antarctica's largest ice shelves are the Amery (in the major indentation on this stretch of coastline, Prydz Bay) and the Shackleton and West ice shelves (between 80°E and 110°E). There are also numerous large and small glaciers providing a constant supply of icebergs of all shapes, sizes and colors.

The coastal current that flows to the west along the continental shelf also brings into this region icebergs that have been formed in the Ross Sea. The coastal current links to the eastward-flowing Antarctic Circumpolar Current in a series of gyres and these clockwise water flows bring icebergs northwards. They fragment and melt as they enter warmer waters. The consequences of these circulation patterns are that icebergs are not evenly distributed across this area of ocean, and that the types of icebergs observed can vary from place to place.



* from "The Rime of the Ancient Mariner," by Samuel Taylor Coleridge (1798)

Why Icebergs Can Have Colors and Stripes

Icebergs are formed from the glacial ice that has built up from snow falling on the Antarctic continent over millennia. This ice consists of pure fresh water. The ice flows slowly to the coast and breaks off either from glaciers or from ice shelves. Because the ice shelves are very thick and are floating, the seawater beneath them interacts with the glacial ice. As seawater is drawn deep under the ice shelves by the oceanic currents, it becomes supercooled. Under certain conditions it can freeze to the base of the ice shelf. Because this ice is formed from seawater, it differs from the freshwater ice of the ice shelf. Often, the frozen seawater contains organic matter and minerals causing it to have a different color and texture. Thus icebergs broken off from the ice shelves may show layers of the pure blue-white glacial ice and greener ice formed from frozen seawater. As the bergs become fragmented and sculpted by the wind and waves, the different colored layers can develop striking patterns.

Pure glacial ice, too, can exhibit striking color patterns. This is thought to be a result of melting that can occur on the continent before the bergs break off. Crevasses high on the Antarctic plateau can fill with melt water and then re-freeze, producing layering of blue ice within a white ice matrix. After calving, the bergs begin eroding and the alignment of the stripes can become irregular, leading to icebergs with spectacular appearances.

The conditions for the formation of these color patterns are not found everywhere around Antarctica, so there are areas where colored bergs are more common, and other areas where they are rarely seen. In some parts of the Southern Ocean, bergs are carried quite far north in the currents. In other places, the bergs remain close to the coast, often trapped on shallow banks. Melt rates and erosion also vary with air and water temperatures. Circulation patterns in the open ocean can also result in areas fairly far to the north where bergs can accumulate.

I had rarely seen either striped bergs or jade bergs until our voyage to the 30°E–80°E region in early 2006. We surveyed a very large area (approximately 1.5 million sq km, roughly twice the size of Texas) from the coastline to 62°S. We were able to document the distribution patterns of many physical, chemical and biological properties of this little-visited part of the world. Icebergs in the open ocean were rare and not evenly distributed. A particular hot spot for icebergs was



BANZARE Bank (located at 58°49'60"S, 77°0'E and named for Douglas Mawson's British Australian and New Zealand Antarctic Research Expedition of 1929-31) which lay in the north east corner of our survey area (see map).

At BANZARE Bank we encountered a large number of vividly-colored icebergs. The presence of jade bergs in this area may be a result of the circulation pattern that flows northwards from the Amery Ice Shelf and interacts with the vast Antarctic Circumpolar Current as it meanders around the Kerguelen Plateau. The presence of so many icebergs in the northernmost reaches of our survey area was a welcome visual relief from the monotony of the open ocean. Although the banks close to Antarctica provide considerable distraction thanks to the innumerable icebergs that are often stranded on them, the offshore banks are frequently distinguishable only by echo-sounders—and more frequently these days, by the presence of fishing vessels.

One of the frustrations of conducting scientific surveys with rigorously-prescribed tracklines is that it is difficult to deviate from the approved route. Most such surveys are also very tightly timed, so any deviations would mean that some planned sampling would have to be dropped. Thus, as we steam along the transect line at a standard speed (usually 10 knots), we pass a range of unique

sights—pods of blue whales, flocks of birds feeding on krill swarms, packs of crabeater seals or jade icebergs—that are often just visible in the distance but which must be reluctantly passed by. On rare occasions such phenomena occur on, or close to, the transect line and the ship swarms with camera-wielding scientists duplicating each others' efforts to capture forever sights that few people are privileged to observe.

To some extent, the inability to investigate transient phenomena viewed from the research vessel is compensated for by the fact that many scientific voyages are out on the ocean for very long periods (up to three months), so the chances of encountering objects worth photographing are increased. Perhaps the most significant problem emerges in the period following the return of the voyage, because the only people who can really understand the photographic record of the cruise are those who participated in it. Each cruise participant returns with gigabytes of photographic memories. Most of these photographs are almost identical to those of their shipmates', so evenings of fond reminiscence have a tendency to become somewhat repetitious! □

Steve Nicol earned his PhD in biology from Dalhousie University in 1984. He joined the Australian Antarctic Division (AAD) in 1987 to lead its krill research team. Since 1999 he has been Program Leader for the AAD's Southern Ocean Ecosystems Program.

Night Detaille: Tourist Camping South of the Circle at Base W

by Jeff Rubin

0015 hours, 2 January 2008: Wriggling my toes in my boots to keep the blood moving, I sit on the rickety wooden steps with my back to the door of the generator room of the hut, looking out over the water. Grey cloud merges with greyer sea, but the bay is studded with icebergs, white and light blue, and small white bergy bits.

The white-hulled ship stands off, the captain understandably reluctant to come closer. Admiralty chart 3570, "Brabant Island to Adélaïde Island," includes the sober notation: Uncharted dangers may exist, particularly within the 100-fathom line.

This island, just a dot at the mouth of Lallemond Fjord in the southern reach of Crystal Sound, floats in a wide expanse of sheltered water bounded by spectacular mountains dripping with huge glaciers descending to the sea.

Way out in the fog, the ship's three lights—one red, two yellow—reappear and disappear. We're just south of the Circle, not long after the equinox, but visibility is not good tonight.

Pitched on the snow in front of me are 11 two-man tents. I'm on nightwatch, making sure no harm comes to the 20 tourists who paid extra to experience Antarctic camping. In the eleventh tent, my colleague "Campmaster Jamie" gets a few hours' shut-eye before taking his turn on watch.

No muffled voices or snores emerge from any tents, and out of respect for the sleepers, I keep quiet myself.

Forget Scott's and Shackleton's huts on Ross Island, which have been souvenired and re-arranged many times since they were abandoned at the beginning of the last century—and are now, sadly, being "restored."

For a real Antarctic time capsule, look no

further than tiny Detaille Island (named for Monsieur Detaille, who assisted French Antarctic explorer Jean-Baptiste Charcot), located well down the west coast of the Antarctic Peninsula.

Built in 1956 and hurriedly evacuated just three years later in 1959, the Detaille Island hut—known as "Base W"—provides an undisturbed look at the early days of Britain's Antarctic program, the Falkland Islands Dependencies Survey, predecessor to the British Antarctic Survey.

Detaille's short history is filled with epic dog-sledging journeys, dangerous survey work, and the creativity displayed by its inhabitants, who filled their off-hours with homely recreation like reading, writing and playing Scrabble on a hand-drawn board.

Thanks to its location, Detaille is often the goal of ELs (expedition leaders) on "Circle crossing" tourist cruises, which steam south along the Peninsula in order to cross that mythical line. Unfortunately, though, high winds and seas often prevent landings here.

0045 hours: Twenty feet below and to my right a skua hen broods an egg or two—I can't see how many—among snow-covered debris, bits of wood and what appears to be a large flat crate.

When I stand to stretch my stiffening legs, she calls nervously: "Ow! Ow! Ow! Ow!"

Her mate zooms in from somewhere nearby, flying straight at my head, his wings spread wide, their white flashes bright against the brown feathers.

I curse the dive-bombing father, then consider that he's only doing his duty, and sit down again on my chilly perch.



In Crystal Sound: a real Antarctic time capsule

Base W's unusual state of preservation is due to the local hydrography.

After being constructed at great expense, the Detaille base was abandoned because the local sea ice was dangerously unstable. It had been planned that dog-sledging parties would cross the sea ice to the nearby Antarctic Peninsula for survey work.

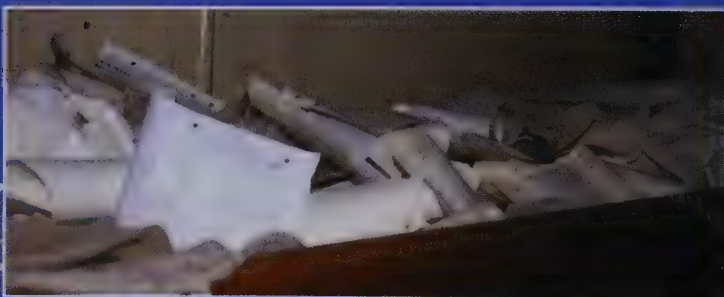
Ironically, when the base was to be closed in the winter of 1958–59, heavy sea ice kept the resupply ship *Biscoe* from approaching closer than 30 miles, despite the assistance of two U.S. icebreakers. So the Base W men were forced to load their sledges with only their most valuable possessions and equipment, leaving all else behind. Using dog teams, they sledged the 30 miles to the ship.

But as the dogs were being loaded aboard *Biscoe*, one named "Steve" escaped and ran back towards its former home on Detaille. Since time was short, the departing team was forced, very reluctantly, to leave him to his fate.

Three months later, the men at Britain's Base Y at Horseshoe Island 60 miles to the south were amazed to see Steve come running up, healthy and fit. They guessed that he had survived on a pile of seals at Base W, previously killed for dog food, before setting off to Horseshoe. Because he had once been in a team that covered the trail, over sea ice and glaciers, Steve must somehow have recalled the way.

0100 hours: As soon as I rise from the steps, the skua hen takes up her call: "Ow! Ow! Ow! Ow! Ow! Ow!"

Her mate swoops in again, disconcertingly close, scolding me angrily. I move off quickly, as quietly as possible.



"We all hope you and your companions are keeping well. My new ruses are looking very bonny..."

After I keep the hourly radio sked with the ship, letting the officer on the bridge know that all is well, I walk back along the side of the hut. I think again how messy the grounds are, a contrast to the relatively neat arrangement inside the hut. There's a large spool of heavy wire, long gas cylinders, disintegrating crates, rolls of Rubberoid for the roof, a wheelbarrow, cracked glass jars, lots of rusting metal, and a wooden box of large tins spilling what looks like pink and white lard.

In the coming weeks, as the snow melts and reveals more junk, things will only get worse.

Somewhere on this tiny island, a small historical footnote in the game of tennis was recorded, for here a match was played for the first time south of the Antarctic Circle.

After opening the 1956 Olympics in Melbourne, HRH The Duke of Edinburgh visited several British Antarctic bases. One of the men in the prince's party, an American observer, was such a keen player that he brought tennis gear along to Antarctica.

Because the balls did not bounce on the snow, the game was modified to "continuous volleying." Not only Prince Philip but several others in the party—including 69-year-old Sir Raymond Priestley, who had earlier been with both Shackleton and Scott—joined in the fun, forming the first Antarctic Tennis Club.

Naturally, the members later had their own exclusive club ties designed and made, featuring, of course, penguins and crossed racquets. (cf Sir Vivian Fuchs' *Of Ice and Men*, 142-4.)

0120 hours: On my next circuit of the campground, I pull my hat down around my ears and zip my coat up to my chin.

Earlier, I surprised a small group of men sitting in the snow beside two empty Champagne bottles, smoking cigars (Cuban, they told me). They looked up guiltily, hurrying to explain that they were putting the ashes

into a can. I assured them—rather ironically, I thought, considering the rubbish I'd just seen—that so long as they made no mess and kept well away from the wooden hut, it was OK.

Now I consider another trip down to the boatshed. In the afternoon, I had post-holed my way through five-foot-deep snow to replace the shed's heavy wooden door, which had blown in and fallen off its hinges.

Instead I walk up to the old kennel, formerly home to the base's dog teams. Looking in at the tangle of chicken-wire and weathered wood, I hear in my imagination the huskies' excited high-pitched barks as they are harnessed in their traces for a long run. But the only sound is the sighing wind.

Today, Base W is a well-preserved museum of 1950s Antarctic life. Racks of heavy wooden skis line the main corridor. Mattresses remain on the bunks. A pair of scratchy woollen long johns hangs on a line over a small kerosene heater, awaiting an owner who will not return.

The hut's small kitchen is all but filled by a large wooden table with storage chests as benches. Beside an Esse Fairy coal stove sits a galvanized steel bucket of anthracite. Life-buoy soap rests by the sink, and rusting tins of Yellow Dollar Scotch Oats stacked in the cupboards still bear the slogan "the food of a sterling race."

On a winter night long ago, the Tilley lamp on the table may once have illuminated a copy of *Tailwagger* magazine (for dog fanciers), or perhaps the nearby sporting magazine featuring on its cover Chris Chataway, who paced Roger Bannister in the first sub-4:00 mile in 1954.



The food of a sterling race.

PHOTO BY JEFF BLUM

are swimming in the narrow channel, no wider than a small stream, between Detaille and its neighboring island. The seals glide underwater, twisting and turning over one another like graceful phantoms. I stand on a high ledge overlooking the channel and the bay behind, covered with brash, bergy bits and grease ice. Far out, Andresson Island is only a silhouette in the dim overcast light.

I shove my gloved hands into my pockets for extra warmth. A group of kelp gulls flies up, noisily greeting one another, then lands and falls silent. On the neighboring island, four Weddells sleep in the snow.

A lone Adélie penguin climbs out of the sea and immediately begins calling raucously in the quiet. What I take at first to be the echoes of her calls turns out to be another Adélie answering from a nearby islet.

A pile of typed radio messages is scattered over the mattress on one of the top bunks. Reading the poignant letters reminds me of the great isolation the expeditioners experienced during their two-year stints in the icy wilderness. No email or Iridium phones reached home, and even the radio could be unreliable.

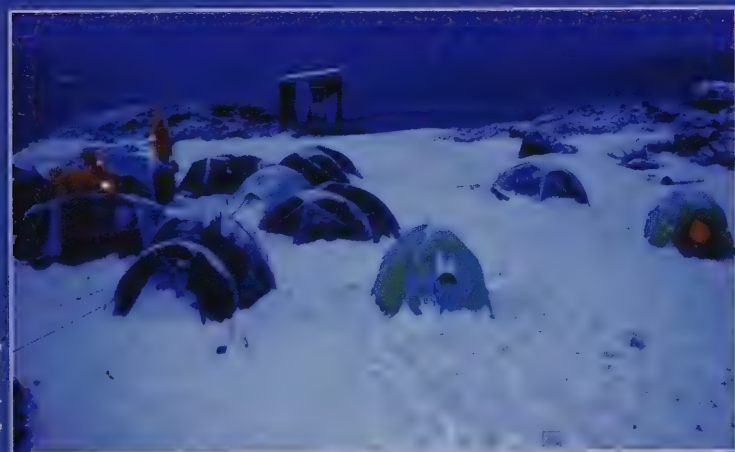
"Have planted gladioli and some different kinds of lillies," a Mum wrote to her son John 50 years ago. "My new roses are looking very bonny. . . Hope all are well at your base."

Another mother wrote, "We all hope you and your companions are keeping well and enjoying your new base. . . We are all keeping well and enjoyed an early spring. Daffodils, hyacinths, primroses have been in bloom a week or more." Still another message alerted one base member that a certain young woman "has been asking about you."

0545 hours: Camp is broken, tents and sleeping bags packed, the portable chemical toilet closed and sealed.

I trudge back downhill through the deep snow to the boatshed as the last campers are driven by Zodiac to the ship. I check that the door is secure, then hurry to the landing, where Jamie and Luke are piling sleeping bags and other gear into the boats. Back on the ship, our breakfast awaits. □

0140 hours: Three crabeaters



Way out in the fog, the ship's three lights reappear and disappear

Antarctic Artist Robert E. Hogue

by Steve Dibbern

Several years ago I was introduced to J.Q. Tierney-Holly, an oceanographer who had participated in Deep Freeze I, through and beyond the IGY, on Navy and Coast Guard ships in the Antarctic. He described a number of paintings, sketches and pastels done by Robert E. Hogue. My interest was piqued, because almost all of the resources I could find listed only the artists Robert Haun (see *The Polar Times* centerfold, Spring-Summer 2003), Standish Backus (see *The Polar Times* centerfold, Fall-Winter 2002), and Leland Curtis during the IGY.

I asked J.Q. to fill me in on the story. J.Q. had also been on the 1954-55 reconnaissance of the Ross Sea to set the sites for McMurdo air base and Little America V. On his return he showed his slides to his friend Walter Hogue. Walt asked if his brother Robert (Bob), an artist, could see the slides. Bob was astonished at the color and scenery. (Ice is just white... right?) Bob decided that he had to go! He asked Tierney-Holly if it was possible. J.Q. staffed a request up through the Task Force 43 offices to Admiral George Dufek, the C.O.

Dufek agreed to take Hogue as a "dollar-a-year man": no salary would be paid, but transportation would be provided. It appears that, like an officer, he also had to pay for food.

Robert E. Hogue went south during the 1956-57 summer as a contract artist on several Navy and Coast Guard icebreakers. His first job was to illustrate invertebrate specimens from Tierney-Holly's marine biology dredge nets. Watercolor was and still is very useful in recording and emphasizing the subtle colors of marine organisms in ways that a camera misses. Many of these paintings were sent with specimens to the US National Museum Natural History Division (Smithsonian). Hogue also recorded a number of fish, the so-called "bloodless" (no red blood cells) Antarctic fish with natural anti-freeze in their blood.

Hogue painted and sketched extensively aboard various ships and also at some of



Shackleton's Hut at Cape Royds, painted by Robert E. Hogue



Hogue at work

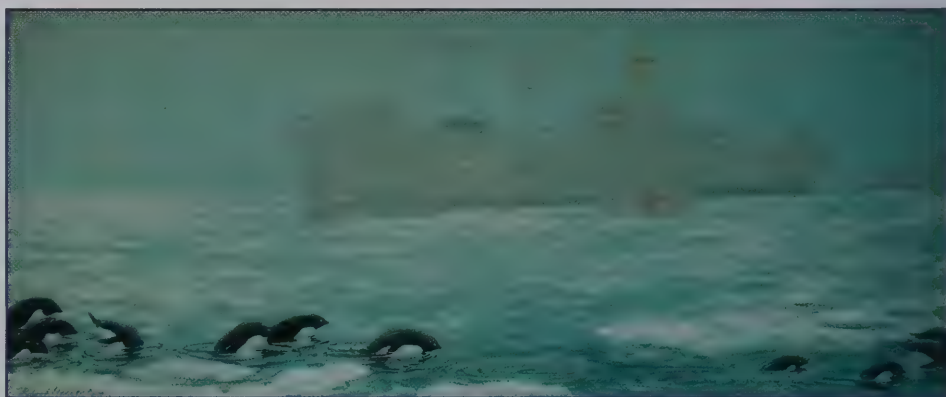
the historic sites in McMurdo Sound. Most of his works are charcoals, pencil sketches, pastels and watercolors. J.Q. told me that Hogue had not come to Antarctica prepared to spend enough time to do oil painting. He found that he did have enough time at McMurdo Sound, however, to do a fine oil rendering of Shackleton's hut at Cape Royds. However, he had no canvases. The bosun on the *Glacier* stretched ship's canvas over a frame he made; he sized the canvas in preparation for painting with white lead paint.

Various paintings and sketches of life on-board icebreakers were later displayed in the halls of the Pentagon, but I have been unable to track where the artworks went from there.

Hogue appears to have gotten around Antarctica quite a bit: his work includes scenes from the sea ice at McMurdo, Cape Royds, Hut Point, Little America V, Cape Hallet and elsewhere. Some show ships and equipment and sailors, while others are scenes of "sea smoke," icebergs, and the seaward face of the Ross Ice Shelf.

The only further information that I have is that after his Antarctic stay, Hogue worked for the Smithsonian. In November 1959, the National Museum of Natural History announced that Hogue had painted the backgrounds for the famous Hall of the World of Mammals display. □

If anyone has any follow-up or more information on this forgotten Antarctic artist, please contact the author at 5996 Via Lane, Crozet, VA 22932, telephone 434-823-8484, or email <victoriadibbern@aol.com>



USS Arneb in fog at Little America V

Dry Valleys Fossils Show Much Warmer Continent

Insects and ferns flourished, then flickered out millions of years ago

National Science Foundation press release, 4 August 2008—Scientists working in the Dry Valleys have discovered the last traces of tundra—in the form of fossilized plants and insects—on the interior of the southernmost continent before temperatures began a relentless drop millions of years ago.

An abrupt and dramatic cooling of 8°C, over a relatively brief period of geological time roughly 14 million years ago, caused the extinction of tundra plants and insects and transformed the interior of Antarctica into a perpetual deep-freeze from which it has never emerged.

The international team headed by David Marchant, an earth scientist at Boston University and Allan Ashworth and Adam Lewis, geoscientists at North Dakota State University, combined evidence from glacial geology, paleoecology, dating of volcanic ashes and computer modeling, to report a major climate change centered on 14 million years ago. The collaboration resulted in a major advance in the understanding of Antarctica's climatic history.

Their findings appear in the Aug. 4 *Proceedings of the National Academy of Sciences*.

"The most interesting part of the whole story is that we've documented the timing and the magnitude of a tremendous change in Antarctic climate: the transition marks a shift from warm, temperate glaciers with patches of fringing tundra to today's cold-polar glaciers set within in a barren polar desert,"

said Marchant. "The contrast couldn't be more striking. It is like comparing Tierra del Fuego today with the surface of Mars—and this transition took place over a geologically short interval of roughly 200,000 years."

The discovery of lake deposits with perfectly preserved fossils of mosses, diatoms and ostracods, a type of small crustacean, is particularly exciting to scientists, noted Lewis. Fossils are extremely rare in Antarctica, especially those of terrestrial and freshwater plants and animals.

For Ashworth the fossils are a scientific treasure trove. He said he was particularly struck that some species of diatoms and mosses are indistinguishable from living creatures. Today, these species occur throughout the world, except in Antarctica.

"To be able to identify living species amongst the fossils is phenomenal," he said. "To think that modern counterparts have survived 14 million years on Earth without any significant changes in the details of their appearances is striking. It must mean that these

organisms are so well-adapted to their habitats that in spite of repeated climate changes and isolation of populations for millions of years they have not become extinct but have survived."

Tom Wagner, program director for Antarctic Earth Sciences in NSF's Office of Polar Programs, added that "Lewis, Marchant and Ashworth discovered the last bit of life on the Antarctic continent. It was hanging on by its fingernails—just a few simple plants and bugs in a small pond, everything else around them frozen over—and then, wham!, they went too. And it must have happened quickly because these fossils are literally freeze-dried. When I visited the scientists in the field, they showed me how the moss was still green and leafy." □

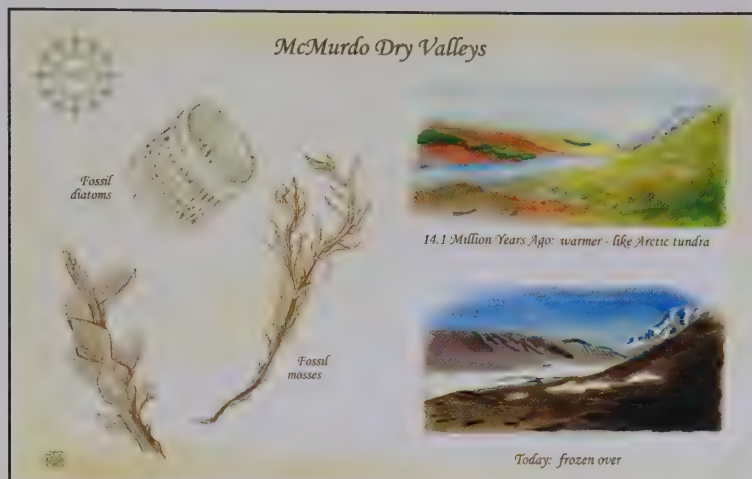


ILLUSTRATION BY ZINA DERETSKY/NATIONAL SCIENCE FOUNDATION

School Named for George W. Gibbs

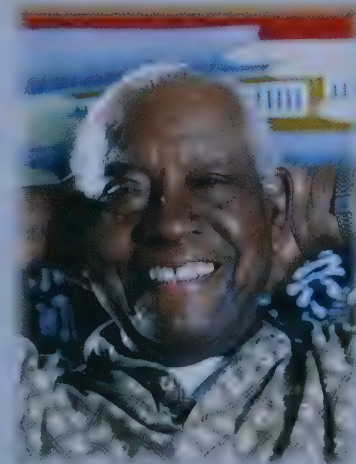
Rochester (Minn.) Post-Bulletin, 5 August 2008, by Elliot Mann—A street near Soldiers Memorial Field won't be the only item in Rochester carrying the name of George W. Gibbs, Jr.

The Rochester school board on Tuesday night finalized the name of the new elementary school in Rochester, choosing to commemorate the former Rochester resident who was the first African-American to walk on the ice shelf in Antarctica (see *The Polar Times*, Jan. 2007). Many recall Gibbs, who died in 2000 at age 84, as a tireless worker for

civil rights and an inspirational figure.

Gibbs served for 24 years in the U.S. Navy before moving to Rochester in 1963. He worked at IBM until 1982, when he started an employee placement company called Technical Career Placement Inc. The Rochester City Council in 2002 renamed West Soldiers Field Drive after Gibbs.

The district last week broke ground on the new elementary school, located in northwest Rochester. The school is scheduled to open for the 2009-2010 year. □



COURTESY OF LILIAN RASHIDA HENRY

Commemorated in Rochester

Antarctic Notes

Tourist Ship Aground at Cape Anna

IAATO press release, 6 December 2008—MV *Ushuaia*, carrying 82 passengers and 40 crew including ship's staff, grounded at 64°35.5S 062°25' W, at the entrance of Wilhelmina Bay near Cape Anna on 4 December. About 20 hours later, all passengers and five staff were transferred by Zodiac to the Chilean naval vessel *Aguiles* and taken to Chile's Frei station on King George Island, where they were later flown by Argentine C-130 Hercules to the port city of Ushuaia. Two of the ship's diesel tanks were punctured and/or damaged and spilled marine gasoil before flooding seawater sealed the tank. A spill of approximately 50 x 500m was sighted near the grounded ship. Wind was dispersing the oil away from the two closest wildlife sites and towards open water. Divers from the Chilean Naval Tug *Lautaro* who inspected the vessel found propellers and rudders undamaged. A plan to refloat *Ushuaia* is being developed.

New Rifts Form on Wilkins

CNN, 29 November 2008—New rifts on the Wilkins Ice Shelf could lead to it breaking away from the Antarctic Peninsula, the European Space Agency said. The Wilkins is connected to two islands by a strip of ice, a "bridge" that has lost about 2,000 sq km this year. The ice shelf had been stable for most of the past century before it began retreating in the 1990s. Several other ice shelves—Prince Gustav Channel, Larsen Inlet, Larsen A, Larsen B, Wordie, Muller and Jones—have collapsed in the past three decades.

Predicting Iceberg Creation

Agence France Presse, WASHINGTON, 28 November 2008—A mathematical formula developed by researchers at the University of Pennsylvania could help predict when and where icebergs will calve from ice shelves, a study published in *Science* says. The most important variable for knowing when icebergs will be created is how fast the ice shelf is spreading, said the study's co-author, professor of geosciences Richard Alley. If the ice expands slowly, it cracks consistently throughout the shelf—but if it spreads more quickly, there is more chance chunks will snap off.

Balloon Finds Dark Matter Hint

Scientific American online, 19 November 2008, by John Matson—New results from an instrument that detects energetic particles in the upper altitudes above Antarctica show an excess of cosmic-ray electrons that may be a signal of dark matter, researchers say. The study, published today in *Nature*, examines data from a balloon-borne detector called ATIC (Advanced Thin Ionization Calorimeter). The unexpected wealth of electrons in a specific energy range, about 300 to 800 giga-electron-volts, points to a nearby source. One possibility is the annihilation of dark matter, a mysterious particle that current theories indicate is many times more prevalent in the universe than ordinary matter. Other astronomical objects, such as pulsars or microquasars, could also be responsible.

Sub-Ice Flooding Speeds Glaciers

University of Maine press release, 17 November 2008—Using nearly 50 years of data, University of Maine researchers have determined that subglacial floods in East Antarctica caused a rapid and short-lived acceleration of Byrd Glacier, a major outlet glacier. Working with a fellow researcher at the University of Washington, the scientists observed that the Byrd's flow rate increased about 10% in response to the flooding of two subglacial lakes. "Our work shows that the speed of the glacier can change by a very large amount," co-author Gordon Hamilton said. "It only lasted for a year, but if the same process happens again at a larger scale, sea level could rise much quicker."

Funds to Fight 'Scientific' Whaling

The [Melbourne] Age, CANBERRA, 17 November 2008, by Dan Harrison—Australia will spend more than \$A6 million on non-lethal whale research in a bid to debunk Japan's claims that it needs to kill whales for science. "Australia does not believe that we need to kill whales to understand them," Environment Minister Peter Garrett said. "Modern-day research uses genetic and molecular techniques, as well as satellite tags, acoustic methods and aerial surveys, rather than grenade-tipped harpoons." The package includes funding for an independent assessment of the credibility of Japan's "scientific" whaling program.

Southern Ocean 'Barrier Reef' Protected

The [Melbourne] Age, 8 November 2008—Australia has convinced the Commission for the Conservation of Antarctic Marine Living Resources to protect two areas of Southern Ocean seabed, likened to the Great Barrier Reef. The two 400 km² areas are to be declared vulnerable marine ecosystems (VME), protecting them from bottom fishing. The vast coral-line communities are under 800m of ocean about 120km off eastern Antarctica. An Australian-led voyage to the previously-unexplored region earlier this year uncovered a remarkably rich range of life—including glass-like animals known as tunicates, corals, sponges, huge sea worms, giant crustaceans and sea spiders the size of dinner plates.

Americans Evacuate Injured Aussie

Sydney Morning Herald, HOBART, 6 November 2008, by Andrew Darby—A complex rescue mission overcame atrocious weather to evacuate a seriously injured Australian from Antarctica. Davis Station chef Dwayne Rooke was on a field trip when he came off his quad bike and suffered multiple fractures. Mr Rooke, 31, suffering significant pain from his injuries, was heavily sedated for the 10-hour flight aboard a U.S. military Hercules aircraft. A US-Australian medical team assembled in Christchurch and flew to McMurdo. The team had to wait three days before gales subsided enough to make the flight to Davis, where a 3000m temporary runway was built on sea ice.

Antarctica Hit by Climate Change

www.nature.com, 30 October 2008, by Daniel Cressey—In its landmark Fourth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) declared in 2007 that human influence on climate "has been detected in every continent except Antarctica." Now a paper in *Nature Geoscience* says our impact can be found even there. Previous

work has seen Antarctica temperature records ranging from 1900 to the present day collated into one data set. Climatologist Nathan Gillett of Environment Canada, lead author of the new study, and his colleagues compared changes detailed in that data set with temperature changes simulated in four different climate models, running the models both with and without human influence factors. Changes actually observed did not fit with the models when only natural climate changes and variability were present. They were only explainable when human influence on the climate was taken into account.

South Africans Evacuate Injured Norwegian

Johannesburg Times, 20 October, by Thabo Mkhize—A South African team has rescued a seriously injured Norwegian at the Troll research base in Antarctica. The rescue crew left Cape Town on Saturday to evacuate Sigurd Sande, 30, who had a badly-fractured leg. Sande arrived safely in Cape Town 12 hours later.

Rising CO₂ Threatens Krill

The [Melbourne] Age, HOBART, 14 October 2008, by Andrew Darby—The first evidence suggests that a predicted rise of atmospheric carbon dioxide will wreak havoc on krill. Captive-bred krill at the Australian Antarctic Division developed deformities and lost energy when they were exposed to CO₂ at levels predicted globally for the year 2100. The damage meant that the krill were unlikely ever to breed, University of Tasmania investigator Lilli Hale said yesterday. CO₂ is absorbed by the sea most easily in the colder Southern Ocean, which becomes more acidic, interfering with the formation of calcium carbonate. Organisms including krill rely on calcium for the formation of their shells.

DNA Gives Climate Coping Clues

Australian Broadcasting Corp. online, 14 October 2008, by Anna Salleh—DNA in the bones of Adélie penguins that survived the last ice age are helping to shed light on how other animals will cope with climate change, Professor David Lambert of Griffith University and colleagues report in *PLOS Genetics*. Lambert says Adélie penguins have survived 10°C of warming since the last glacial maximum 18,000 years ago, which may mean that some species are able to respond to climate change even when they can't move geographically.

Russian Station Fire Kills One

RIA Novosti, MOSCOW, 9 October 2008—A two-story building at Progress station caught fire, killing a construction worker and seriously injuring two others. The head of Russia's Antarctic program, Valery Lukin, said the fire broke out on Sunday, completely destroying the radio equipment, which made it impossible to contact Russian officials about the incident until Thursday. Progress, where 29 people are based, was opened in 1989 in East Antarctica's Larsemann Hills.

Climate Change to Devastate Penguins

WWF News Centre, 8 October 2008—Half to three-quarters of major Antarctic penguin colonies face decline or disappearance if global temperatures are allowed to climb by more than 2°C. A new WWF report, "2°C is Too Much," shows that 50% of emperor penguins and 75% of Adélies are under threat. Climate models forecast that a 2°C temperature rise

above pre-industrial levels could be a reality in less than 40 years, producing a strong reduction in the sea ice cover of the Southern Ocean which is an essential nesting and feeding ground for emperors and Adélies. A reduction in sea ice will affect the abundance of krill, a vital food source for penguins.

2008 Ozone Hole Larger than 2007

European Space Agency press release, 7 October 2008—The 2008 ozone hole is larger both in size and ozone loss than 2007 but is not as large as 2006. This year the area of the thinned ozone layer over the South Pole reached about 27 million km², compared to 25 million sq km in 2007 and a record ozone hole extension in 2006 of 29 million sq km, about the size of North America.

Antarctic Trees Were Different

Science News, HOUSTON, 6 October 2008, by Sid Perkins—Trees that grew in Antarctica millions of years ago had a growth pattern much different than modern trees, according to a new study reported during the Geological Society of America meeting. Fossils indicate that plants thrived in Antarctica from 400 million to 34 million years ago, says University of Kansas paleobotanist Patricia E. Ryberg. Lush forests covered Antarctica during some parts of that interval. But ancient Antarctic trees grew nothing like today's trees do. Modern trees in temperate climates have annual growth rings no wider than 2mm. Some Antarctic tree fossils from 255 million years ago have growth rings close to 10mm wide. The Antarctic trees, Ryberg says, were exposed to 24-hour sunshine during the height of summer and might have grown continuously then.

Windfarm Construction to Start

New Zealand Herald, 6 October 2008, by Naomi Arnold—Construction starts next month on a windfarm to supply power to New Zealand's Scott Base and the U.S. McMurdo station. The windfarm, overlooking Scott Base, is expected to reduce combined fuel consumption by up to 500,000L a year, a saving of 11%. Antarctica New Zealand's manager of Antarctic support, Iain Miller, said by February 2010 diesel would be only augmenting the power provided by the turbines, which would generate 87% of Scott Base's electricity needs and 15% of McMurdo's. Three 330kW, \$NZ10 million turbines will be installed at Crater Hill.

Antarctica Visit 'Rights' Proposed

Netherlands Organization for Scientific Research press release, 26 September 2008, by Dr. Bas Amelung—With strict guidelines and codes of conduct, the umbrella organization of Antarctic tour operators, IAATO, has been able to dispel many of the concerns about the growth in Antarctic tourism. However, self-regulation is no guarantee for a healthy Antarctic tourism industry. One possible solution is that of marketable visitor rights, as is already used in climate policy by means of trading in CO₂ emission rights. First, a maximum annual number of tourist days in Antarctica will be set. To ensure a smooth transition, this maximum will be set higher than the actual number of tourists days used. As soon as the demand for holiday days in Antarctica is higher than the maximum, the rights to the days will have a certain value.

By awarding the rights to the Antarctic Treaty Sys-

tem, the income can be used, for example, for monitoring and enforcement purposes, for which there is little money at present. The rights will be auctioned to the highest bidders, who are free to trade the rights further. This will ensure that the available 'space' in tourist days will be used for the most profitable forms of tourism. This system of marketable visitor rights could allow three objectives to be realized: the scale of tourism and with this its effects will be limited, an urgently desired new source of funding will become available for monitoring and enforcement, and the tourism trade in the Antarctic area will remain financially healthy. (The study "Sustainable Tourism in the Antarctic Peninsula: Future Pathways and Policies" is being funded by the Netherlands Polar Programme.)

USAF Makes 1st Antarctic Night Landing

Associated Press, WELLINGTON, 12 September 2008—A U.S. Air Force pilot has landed a plane in Antarctica in the dark for the first time using night-vision goggles, a feat that could lead to more supply flights to bases during dark winter months. The C-17 Globemaster landed in a snowstorm on McMurdo's ice runway after months of practice runs by pilots using the goggles. Air Force Lt. Col. Jim McGann said the airplane's own lights—reflecting off of traffic cones—allowed it to land without runway lights.

Unusual Dino Named for APS Vice-President

University of Washington press release, 8 September 2008—Paleontologists have found a previously unknown amphibious predator that roamed Antarctica 240 million years ago. *Kryostega collinsoni*, a prehistoric amphibian distantly related to modern salamanders and frogs, resembled a modern crocodile, and probably was about 15 feet in length with a wide, 2.75 feet long skull even flatter than a crocodile's. Fossil evidence shows teeth on the roof of the mouth of the newly found species, probably as large as those at the edge of the mouth. It is described in the September *Journal of Vertebrate Paleontology*. "Kryostega" translates to 'frozen' and 'roof,' which refer to the top of the skull; "collinsoni" honors James Collinson, professor emeritus of Earth Sciences at Ohio State University who made important contributions to Antarctic geology. William Hammer of Augustana College collected the fossil in 1986.

China to Build Dome A Base By 2010

Xinhua, URUMQI, 4 September 2008—Wu Jinyou, party secretary with the Polar Research Institute of China, said that the 25th Chinese Antarctic expedition starting in October will mainly focus on building a new station on Dome A and further exploration of the Antarctic plateau. The Chinese Arctic and Antarctic Administration (CAA), affiliated to the State Oceanic Administration, said on its website that the construction might last through 2010.

Australian Criticizes Japanese Study

Australian Associated Press, 3 September 2008—An Australian marine scientist has dismissed Japanese research that the body mass of minke whales is declining because of increasingly scarce ocean resources. Australian Antarctic Division researcher Nick Gales says the study's methodology is flawed. "The type of statistics they use are relatively simple, there are some other statistical models they could have used to more robustly test whether this trend is really real," Dr Gales told ABC

Radio yesterday. Even if the findings about blubber are correct, the reasons given are spurious, he said. "It's an incredibly simplistic interpretation and there are many others that would be probably be vastly more plausible. If there is a real decline in blubber then the reasons for that are much more varied and it could be a whole range of things that have nothing to do with the amount of krill and whales." The Japanese researchers failed to take into account their own conflicting data which showed things such as a high rate of pregnancy among the minke, he said.

Controversial Study: Whales Losing Blubber

guardian.co.uk, 26 August 2008, by David Adam—Japan's scientists claim their controversial whaling program has produced a key finding. The new study, published by *Polar Biology* online last month, analyzed measurements taken from 4,689 adult minke whales killed by the Japanese whaling fleet between 1988 and 2005. It found that blubber thickness and overall fat weight decreased by 9% over the period, which it called a "substantial decline." Girth of the animals was down 4% The team says this is the first evidence that global warming could be harming whales, because it restricts their food supplies, and adds that the discovery could only have been made by killing the animals. Lars Walloe, a whale expert at the University of Oslo, who helped the Japanese team analyse the data, and is an author of the new study, said the decline in blubber was due to shrinking numbers of Antarctic krill; the amount of blubber lost is equivalent to 36 fewer days of intensive summer feeding.

Penguins Dumping Arsenic

NewScientist.com, 21 August 2008, by Catherine Brahic—Penguin guano, new research says, is the main source of arsenic accumulation in Antarctic soil. Zhouxi Xie of the Institute of Polar Environment at the University of Science and Technology of China and colleagues looked at arsenic in the droppings of three bird species and two seal species on Ardley Island. Gentoo droppings contained nearly twice as much arsenic as that of the southern giant petrel and up to three times more than the local seals. Sediments from another Antarctic island with no resident penguins but a similar geology contained half the levels of arsenic compared with Ardley. It is not known why the contaminant should be excreted more by penguins than by other top predators, such as seals. "It may be related to how arsenic is metabolised by penguins," says Xie. Journal reference: *Environmental Geology* (DOI: 10.1007/s00254-007-1054-6)

Blue Whale Decline Led to Krill Fall

Deutsche Presse Agentur, BERLIN, 13 August 2008—The near-eradication of blue whales in Antarctic waters during the early 20th century led to a paradoxical fall-off in krill, Alfred Wegener research institute marine biologist Victor Smetacek told the German weekly *Die Zeit*. Blue whales once consumed 180 million tons of krill a year in the Southern Ocean—more biomass than the entire world fishing and aquaculture industry produces annually. The "Antarctic Paradox" results from a biological cycle in which the whales play a key role in providing the iron to surface waters needed by the algae on which the krill feed. The whales release the iron in their excrement, restarting the cycle from algae to krill to whale.

Long-Term Warming Linked to Tropical Pacific

National Center for Atmospheric Research (NCAR) press release, 12 August 2008—Dramatic year-to-year temperature swings and a century-long warming trend across West Antarctica are linked to conditions in the tropical Pacific, according to an analysis of ice cores conducted by scientists at NCAR and the University of Washington. The findings show the connection of Antarctica to global warming, as well as to events such as El Niño, a periodic shift in air pressure accompanied by oceanic warming in the tropical Pacific. "As the tropics warm, so too will West Antarctica," says NCAR's David Schneider, who conducted the research with UW's Eric Steig. The research appears this week in the online early edition of *Proceedings of the National Academy of Sciences*.

Antarctica Iceless 40M years ago

United Press International, CARDIFF, Wales, 30 July 2008—Scientists studying marine fossils say they've determined Antarctica 40 million years ago had warmer seas and little or no ice. Catherine Burgess from Cardiff University and colleagues studied the chemical analysis of exceptionally well preserved fossils of marine micro-organisms found in sediments on a cliff face in New Zealand. The research is reported in the August *Geology*.

Boulder May Prove N. American Connection

National Science Foundation press release, 17 July 2008—A lone boulder found high atop the Nimrod Glacier may provide additional key evidence to support a theory that parts of Antarctica were connected to North America hundreds of millions of years ago, U.S. and Australian investigators write in the July 11 *Science*. The find came by serendipity while they were picking through rubble carried through the Transantarctic Mountains by ice streams from East Antarctica. One rock, small enough to heft in one hand, was later determined to be a very specific form of granite with a particular type of coarse-grained texture. Subsequent tests revealed that the boulder had a chemistry very similar to a unique belt of igneous rocks in North America not found elsewhere. □

Ellies as Oceanographers

Scienceline.org, 29 October 2008, by Dave Levitan—A study in the August 19 issue of *Proceedings of the National Academy of Sciences* provides the latest example of using animal tracking to collect data about the environment in which the animals live. Tagged elephant seals were able to fill in crucial blank spots in oceanographic and ice formation data in the Southern Ocean.

The seals' behavior makes them excellent data collectors. "Elephant seals forage over large regions covering lots of ground, and at least once a week you can expect a dive down to 1,000 meters," said Daniel Costa, an evolutionary biologist and ecologist at the University of California, Santa Cruz and an author on the study. "You can do a lot from ships, but they are extremely expensive and can't go to a lot of places. The end result is that we have very little data."

Fifty-eight seals fixed that problem, providing a more complete view of ocean front structure and ice formation around Antarctica. The seals collected 8,200 profiles of temperature and salinity, from which scientists can infer ice formation, in the remote southern seas from 2004 through 2005. The result was more than nine times the information acquired from floating buoys and ships in that region combined.

Even more striking were the 4,520 profiles seals provided from within the sea ice zone near Antarctica, a 30-fold increase over the

data from ships and buoys. The ice formation rates measured by the elephant seals matched those determined by mathematical modeling, supporting the reliability of the animal-collected data.

The tags used on the elephant seals are small computers—about the size and weight of a New York strip steak—with several sensors to collect data on the animals' surroundings. The tags have memory to store data, a clock and a transmitter that allows them to send data to a satellite. All of this runs on battery power.

Costa's team has conducted extensive testing to make sure the tags do not affect the seals' behavior in any way. "The size of the tag is not an issue because the [elephant] seals are so big," he said. "We haven't found any changes in terms of how much time they spend at sea, how far they go, weight gains or breeding behavior."

Elephant seals are already providing important data on some obvious effects of climate change. In March 2008, a giant chunk of the 6,000-square-mile Wilkins Ice Shelf broke off the western side of Antarctica, and the rest of the shelf is hanging on by only a thread. The seals tracked by Costa and colleagues were swimming around and under that shelf both before and after the break and have provided information on water conditions that may lead to such events. □

On the Web

The below is a collection of web site addresses mentioned in stories in this issue, as well links to other news of interest not included in *The Polar Times*.

(Please note, some of the links are two lines long, so be sure to use the complete link.)

FROM THE POLAR TIMES

"Polar Shifts" (p.3)

- www.globalwarming101.com
- www.sagaxexpeditions.com

"Musk Ox Story" (p. 6)

- www.doomingmak.com

"Enigmatic Gamburtsevs" (p. 31)

- www.ideo.columbia.edu

"Due South" (p. 32)

- www.encountersfilm.com
- www.icepeople.com
- icestories.exploratorium.edu/dispatches/index.php

"Readers Respond: Striped 'Bergs'" (p. 33)

- www.atmos.washington.edu/~sgw/s_warren_pub.html

Book Reviews

- www.polarworld.co.uk (Face to Face)

OTHER

"New Laws Needed in Changing Polar Regions"

- <http://afp.google.com/article/ALeqM5jnTq2a4zaRtQl-2hW-IMEc8nCtiig>

"Sir Hubert Wilkins-Ellsworth Trans Arctic Submarine Expedition of 1931"

- http://explorers.org/calendar/view_entry.php?id=10185&date=20081006

"Greenland votes to loosen ties with Denmark"

- <http://www.cnn.com/2008/WORLD/europe/11/25/greenland.referendum/index.html>

"1000 Days in the Ice"

- <http://ngm.nationalgeographic.com/2009/01/nansen/sides-text>
(If the story does not appear, click on "Feature Article." And be sure to take a look at the photo gallery!)

"Mystery of Lost US Nuclear Bomb" (movie clip)

- <http://news.bbc.co.uk/2/hi/europe/7720049.stm>



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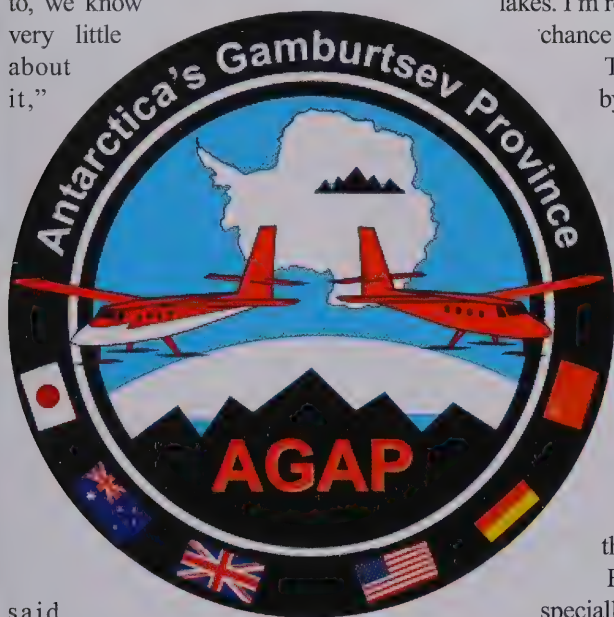
Exploring the Enigmatic Gamburtsevs

National Science Foundation press release, 14 October 2008—A U.S.-led team of scientists from Australia, China, Germany, Japan and the United Kingdom will pierce the mysteries of one of the globe's last major unexplored places this month. Using sophisticated airborne radar, they will virtually "peel away" more than 4km of ice covering an Antarctic mountain range that rivals the Alps in elevation, and which current scientific knowledge suggests shouldn't be there at all.

They hope to answer basic questions about the nature of the southernmost continent—and specifically the massive East Antarctic Ice Sheet—including how Antarctica came to be ice-covered in the first place, and whether, as many believe, that process began millions of years ago in the enigmatic Gamburstev Mountain range.

Working at extreme altitudes, in temperatures as low as -40°C , the researchers of the Antarctica's Gamburstev Province (AGAP) team hope that technology will help them learn whether the Gamburstsevs were born of tectonic activity in Antarctica, or date from a period millions of years ago when Antarctica was the center of an enormous supercontinent located at far lower latitudes.

"Because the heart of East Antarctica is so difficult to get to, we know very little about it,"



said Robin Bell, of Columbia University's Lamont-Doherty Earth Observatory, who shares the leadership of the U.S. science effort. "The Gamburtsev mountain range is fascinating. It defies all geological understanding of how mountains



Aircraft specially equipped with ice-penetrating radar technology, gravimeter and magnetic field sensors will fly survey lines over an area twice the size of California.

evolve. It really shouldn't be there. We think also that there's a strong possibility that the mountains are the birthplace of the East Antarctic Ice Sheet. Over 30 million years ago, ice began to grow around the peaks, eventually burying the range and its surrounding lakes. I'm really excited that at last we have a chance to find out what happened."

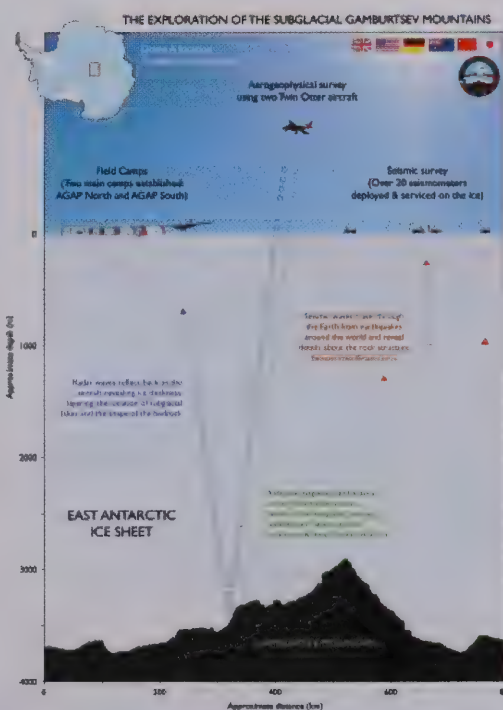
The Gamburtsevs were discovered by a Soviet traverse during the IGY, which named the range for Grigory Gamburtsev, a Soviet seismologist known for his efforts to predict earthquakes. Since that time, the region has been largely untouched.

The teams will be based at a pair of remote field camps while they complete the first major geophysical survey to "map" the mysterious landscape.

British and American aircraft, specially equipped with ice-penetrating radar technology, gravimeter and magnetic field sensors, will fly survey lines over an area more than twice the size of California.

"These methods are similar to medical technologies like X-rays and MRIs

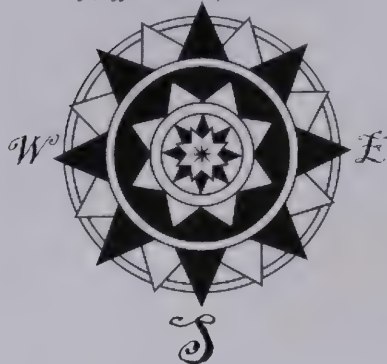
that capture images from deep inside a human body," Bell said. She added that the scientists will eventually create a coordinated mosaic of images drawn from the shallowest layers in the ice sheet down to regions hundreds of kilometers beneath the hidden mountains, in effect creating a three-dimensional map of the vast and unexplored region. □



Scientists as Subjects

Due South

by Jeff Rubi *N*, Antarctic Editor



Two new films about Antarctica, each produced by professional filmmakers with a grant from the National Science Foundation's Antarctic Artists and Writers Program, offer an inside look at researchers working on The Ice, as well as the plethora of others who make it possible, and even comfortable, for them to do so.

Before I discuss these films, however, I'd like to point out a really excellent website set up by San Francisco's hands-on science museum, The Exploratorium: <<http://icestories.exploratorium.edu/dispatches/index.php>>

For the IPY, the Exploratorium gave polar scientists cameras and Internet tools and asked them to document their field work themselves. You can follow researchers in both the Arctic and Antarctica—there are several dozen very interesting dispatches, in audio, video and text.

The first of the two Artists and Writers grantees, Werner Herzog, may be the most famous participant in the NSF program to date. He has made more than 40 films, among them "Grizzly Man," "Fitzcarraldo" and "Aguirre, the Wrath of God."

"Encounters at the End of the World" (2 discs, 99 min., 2007; \$22; www.encounters-film.com) is the result of a 5-week visit Herzog and his cinematographer made to Antarctica in 2006. Rather than focusing on the wildlife, Herzog looks at the people working in the U.S. Antarctic Program who comprise what he calls "a hidden society at the end of the world."

His method is fairly straightforward. The camera shows us what Herzog sees and whom he meets on his trip. While he rarely actually interviews people, preferring to let them speak for themselves, Herzog's German-ac-

cented voiceover tells us what he is thinking and feeling about Antarctica.

We meet interesting folks like Scott Rowland, a former banker and Peace Corps worker who now drives McMurdo's shuttle, Ivan the Terra Bus; Stefan Pashov, described as a "philosopher/forklift driver"; glaciologist Douglas MacAyeal, who waxes lyrically about his dreams of walking across the top of mega-iceberg B-15; and Ryan Evans ("filmmaker/cook"), who demonstrates the legendary Frosty Boy soft ice cream machine in the McMurdo galley.

We follow Herzog to "Happy Camper School," the mandatory field-training exercise on the Ross Ice Shelf for all who wish to escape McMurdo's confines. Next we visit seal researchers Olav Oftedahl and Regina Eisert at their sea ice camp. In a machine shop, we watch journeyman plumber David R. Pacheco, Jr. show off his unusual hands, which he claims as proof of his lineage from the Inca royal family.

Some of the film's best footage comes from the New Harbor diving camp. Not only do we see some spectacular views of marine life beneath the sea ice, but we also watch cell biologist Samuel S. Bowser and his team lounging around their hut, watching old science fiction films on a laptop.

There's more—a quick trip to the South Pole, a visit to Shackleton's Hut at Cape Royds, an odd interview with penguin researcher David Ainley in which Herzog presses him about homosexuality and "insanity" among his subjects, a visit to the Mt. Erebus field camp, and still more—in this quirky, fascinating movie that gives a very personal look at Antarctica.

Only once, disconcertingly, does Herzog stumble. As we watch Frank Hurley's black-and-white footage of the collapsing *Endurance* stuck in the ice of the Weddell Sea, Her-

zog intones that the Ross Sea on which his plane landed is the same place where Shackleton's ship ran into trouble.

Don't miss the many extra features on this two-disc set. Chief among them is producer Henry Kaiser's 35-minute "Under the

Sea." Kaiser, an earlier Artists and Writers grantee who now does work as a research diver for the U.S. Antarctic Program, shot nearly all of the underwater footage in "Encounters." Indeed, it was video from Kaiser's first trip to Antarctica that inspired his friend Herzog to go there to shoot his own film.

Anne Aghion spent four months in Antarctica in 2006 to make her "Ice People" (77 min., 2008, \$19.95, www.icepeople.com). Two of her

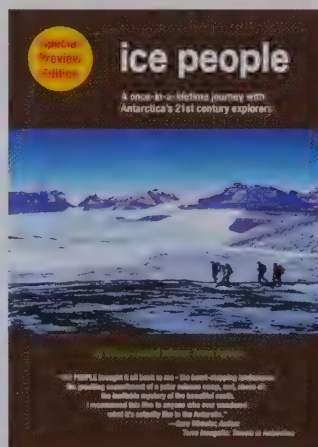
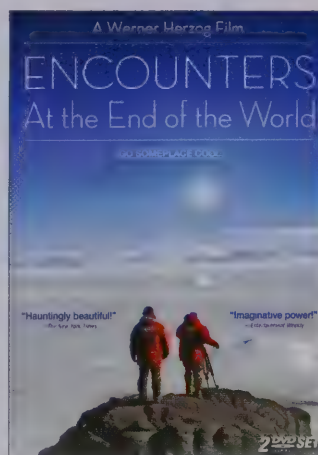
previous films have dealt with post-genocide justice in Rwanda.

Aghion and her two assistants followed North Dakota State University researchers Allan Ashworth and Adam Lewis (and two undergraduate field assistants) as they worked at a fossil lakebed site in the Dry Valleys, where their studies have shown that the Valleys experienced Arctic-like summer temperatures with ice-free lakes hosting a variety of plants and animals until at least 14 million years ago.

"Ice People" opens with a shot of a snow-moving front-end loader in a nighttime blizzard at McMurdo. Soon a huge C-17 Globemaster lands on the sea-ice runway and we next find ourselves at a field camp the filmmakers shared with the scientists for seven weeks in the shadow of Mt. Boreas, the visual equivalent of a Western butte.

Aghion's style is very different from Herzog's. She eschews voiceovers, and

offers very little in the way of explanation. We merely see people doing things, some of which we easily understand (equipment being operated, helo resupply flights arriving, scientists cooking in their tent or making sat-phone calls home), and some of which we



don't (why, for example, do those two undergraduates keep walking in straight lines out from camp, one wearing a backpack carrying a satellite transceiver?).

This film is fairly slow-moving, has no clear narrative, and makes sudden cuts back to McMurdo or even the comms center at Black Island, a strange digression. In that sense, the film mirrors the experience of living and working in a field camp, where there's often not much day-to-day excitement. Even the discovery of some freeze-dried moss—the team's major find—is underplayed, perhaps because its significance was not fully known at the time (see "Dry Valleys Fossils Show Much Warmer Continent" in this issue of *The Polar Times*). But more could have been done to place the scientists' work into perspective.

As a first-hand view of Antarctic fieldwork, "Ice People" shines. We see the decidedly-unglamorous aspects of polar camp life: greasy hair, filling fuel bottles, cooking one-pot meals on the camp stove, emptying the urine bucket, blowing on bare fingers to warm them while sitting around the tent. Then we hear Ashworth declare, "We'll put up with a lot of discomfort for that"—the opportunity to discover something. That neatly sums up the philosophy of old-fashioned field science, and this film allows us the rare opportunity to share the daily lives of geologists doing that important work.

Introducing 'Polar Classics'

A New Feature in the Book Section of The Polar Times.

So many books, so little time—or so it seems. Indeed, the book reviews we offer in each issue are only a sample of the annual production in English of the rapidly growing genre of polar literature. It is difficult keeping up and, worse, we face the risk of losing touch with many of the early works—those first-hand accounts by surviving explorers, the tales of privation and dedication of those who dreamed, and the physical, emotional and intellectual challenges of the 19th- and early 20th-century scientists and scholars, sailors, soldiers and scalawags who opened the final frontiers of this globe. Great stories—classics in every sense—preserved in books, books that rightfully deserve a place in the library of all APS members.

We thank Dave Norton, our former Arctic Editor, for offering the suggestion that we dedicate space in *The Polar Times* on a regular basis to recognize and celebrate those time-tested books that have informed and inspired those who followed in the footsteps of the authors.

On page 34 of this issue, Dave leads off with his selection, "Revisiting a 'Polar Classic'—Life on an Ice Floe: Diary of Ivan Papanin."

In our July 2009 issue we will look to the south for a Polar Classic set in Antarctica. Our format is flexible, and we may offer two or three titles for consideration. Most importantly, we urge that members participate with their recommendations and rationales as to why they believe that a book or books they cite deserve the title of "Polar Classic." □

Polar Art

Until March 1st, an exhibition of more than 50 artworks featuring the polar regions will be on view at the Peabody Essex Museum in Salem, Mass. "To the Ends of the Earth, Painting the Polar Landscape" in-

cludes works by artists including William Bradford, David Abbey Paige (see *The Polar Times*, January 2006), Frederic Edwin Church, George Marston, Rockwell Kent and Lawren Harris. □

Our Readers Respond

Striped 'Bergs

Pure ice is blue because absorption of light increases with wavelength within the visible spectrum. Icebergs formed by compression of snow contain bubbles, and bubbles cause the ice to become blue-white, or white if the bubble density is high. Freezing of seawater to the base of Antarctic ice shelves makes clear ice, which will be green if the water was green (high in organic content) or blue if the water was blue.

The green stripes in *The Polar Times'* pictures most likely originated from bottom-crevasses on an ice shelf that filled with seawater which then froze. I saw such green stripes while on an Australian expedition near Davis Station. In our paper on green icebergs (Warren, S.G., C.S. Roesler, V.I. Morgan, R.E. Brandt, I.D. Goodwin, and I. Allison, 1993: Green icebergs formed by freezing of organic-rich seawater to the base of Antarctic ice shelves. *J. Geophys. Res. (Oceans)*, 98, 6921-6928 and 18309), the stripes are mentioned briefly. We cite Wordie and Kemp (*Geographical Journal*, 1933), who may have been the first to publish a report of striped icebergs. (Wordie was a member of Shackleton's *Endurance* expedition.) There was a picture in *National Geographic* several years ago showing

striped icebergs, with a wrong explanation.

Surface crevasses can fill with surface meltwater that may then freeze if the surrounding ice is cold enough. This is likely the origin of the blue stripes in the top picture in *The Polar Times*. Stuart Smith (Bedford Institute of Oceanography) has photographed such icebergs with blue stripes in the Labrador Sea.

Several papers on icebergs are available as pdfs from my website at <http://www.atmos.washington.edu/~sgw/s_warren_pub.html>

Stephen G. Warren
Professor of Atmospheric Sciences
and of Earth & Space Sciences
University of Washington

Weird Penguins

[Regarding *The Polar Times* July 2008 cover] ... enclosed are two pictures [at right] I took on a trip to South Georgia in December 2006. I think they were taken at Salisbury Plain, but I'm not absolutely certain.

Robert H. Malott
APS Member, Chicago, Illinois



Photos by
Robert H. Malott



On this page, Dave Norton launches a new *Polar Times* series, reviewing books deserving recognition as *Polar Classics*.

Life on an Ice Floe: Diary of Ivan Papanin

New York NY, Messier 1939. (Translation from

Russian) 300 pp. May be found online and in used book shops at various prices.

Reviewed by Dave Norton

Papanin's *Diary* recounts one of the riskiest adventures that Arctic scientists ever survived. It begins (p. 7) with the author and three Soviet colleagues alighting from a 4-engined airplane onto a 3-metre thick floe of sea ice near the geographic North Pole on the 21st of May 1937. With WWII destined to erupt two years later, Arctic know-how assumes growing strategic importance. The men are pledged to drift on this piece of ice, recording and transmitting observations for 11-12 months partly in support of transpolar aviation pioneers. Where and how fast the floe will move are estimates based largely on the drift track 40 years earlier of Fridtjof Nansen's ice-strengthened ship, *Fram*. That drift lasted three years, ending when *Fram* melted out of the ice at 80° N off West Spitsbergen in mid-August 1896. The USSR's Northern Sea Route Administration plans for the ice floe's release from polar pack ice in May 1938 (p.100) off eastern Greenland. There, open Atlantic water is imagined to allow ships and seaplanes to dock alongside their "North Pole-1" (NP-1) floe, and embark the four pagonauts (a.k.a. Papaninites or *Polyarnniki*).

Moscow's experts anticipate the ice station's destination accurately, but seriously underestimate its speed. By contrast with *Fram's* course, NP-1 enters the Transpolar Drift's fastest-moving stream along the eastern coast of Greenland

A summary of velocities from 30 years of post-war drift stations and remote sensing studies (Fig. 1) shows maximum speeds along the east coast of Greenland, followed by those in the flaw zone between Barrow and Siberia. Hindsight from decades of research on drifting Arctic sea ice subsequent to the pioneering Soviet pagonauts' adventure in

1937-38 qualifies their rescue as heroic. Papanin, Ernst Krenkel, Pyotr Shirshov and Zhenya Feodorov happen also to be deployed in a particularly heavy ice year, when a number of Soviet icebreakers are icebound all winter (p. 174).

After transmitting their 26 September position (p. 133), radioman Krenkel receives the reply, "Where are you rushing so fast?" On the 3rd of October, the men calculate that their floe is moving south 20 km per day (p. 141). *Fram's* descent from 85° N to 80° N took 10 months. NP-1 takes half that time to drift from near 90° to 85° N. Ominously, by mid-October, NP-1's southward drift accelerates further.

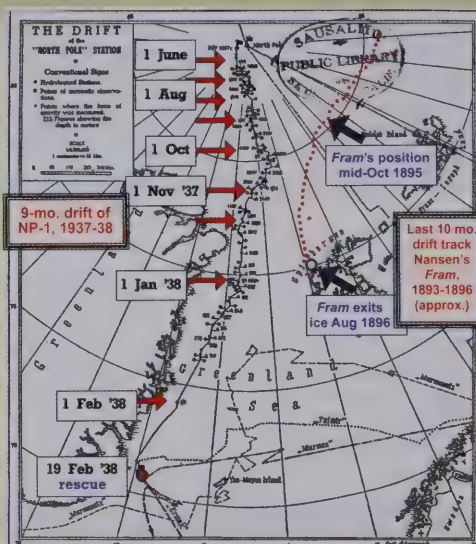


Fig. 2. Trajectory of NP-1, 21st May 1937 to 19th February 1938. Frontispiece from *Life on an Ice Floe: Diary of Ivan Papanin*. Red arrows show monthly change in position, 1 June 1937–1 February 1938. Fridtjof Nansen's last 10 months of drift in *Fram* is shown as dashed red line between two blue arrows (Oct. and Aug. positions) for comparison.

Pagonauts and Astronauts Compared

The men's steady accumulation of oceanographic, bathymetric and meteorologic data becomes an ordeal when compressive forces off the coast of Greenland begin to fracture NP-1 into ever-smaller fragments. As political officer, Papanin is committed to transmitting optimistic radio messages about their glorious Soviet achievements and returning home safely. In reality these four men adrift on Earth's surface are less accessible to rescuers than are today's astronauts orbiting Earth on the International Space Station. *Diary* entries acknowledge this reality. One misstep at the edge of an open lead on the Arctic Ocean is more certainly deadly than today's walks at the end of a tether in airless space. NASA's Apollo 13 mission in 1970 and the fate of Papanin's crew are rival suspense thrillers. To illustrate how desperate the Soviets'



Fig. 3. Ivan Papanin, team leader and diarist for first Soviet drifting ice station, 1937-38.

predicament becomes, I use Papanin's frontispiece (including Sausalito Public Library's stamp of prior book ownership) to chart the progress of NP-1 compared to *Fram* (Fig. 2). The frontispiece also shows tracks of Soviet vessels struggling to reach NP-1.

Why should anyone open the yellowed pages of this 70-year old book? Because it captures eloquently a suite of precedent-setting events. These illustrate building polar expertise through deeds of a very few, very plucky, people. William Althoff's 2007 book, *Drift Station* (reviewed in the July 2007 issue of *The Polar Times*, p. 32-33) uses Papanin's journal extensively. Trusting Soviets' Arctic meteorological data and forecasts amongst European theatre Allies during WWII is part of NP-1's legacy.

With his 5'4" stature, diminutive Ivan Papanin (Fig. 3) defines "pluck." Despite his age and limited physical prowess, he cheerfully helps whenever needed, earning the respect of his younger and fitter men. Papanin's unpretentious prose is balanced. The trusted Communist Party member leads his men in prescribed political activities (p. 36) but bemoans USSR's lack of amateur radio "hams" (p. 32), and savagely lampoons their own medical capabilities, limited as they are by logistics restrictions on NP-1's crew size (pp. 136-37).

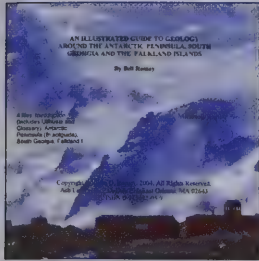
Releasing Papanin's candid chronicle reflects a fleeting thaw in Russians' customary secrecy, and justifiable pride in Soviet Arctic prowess. Significantly, USSR resumes deploying drifting ice stations after WWII, building upon NP-1 experience. How differently would polar history now read, had Papanin and Comrades not cheated death in 1938? Similarly, had the explosion that aborted Apollo 13's lunar landing occurred on the Apollo 11 mission, would U.S. astronauts have persisted in reaching the moon the way more recent Soviet pagonauts persisted in criss-crossing the Arctic Ocean on ice?

Papanin's journal recalls Charles Darwin's *Voyage of the Beagle* (1839), and P. H. Ray's (1885) chronicling his expedition to Barrow as part of the First International Polar Year. As precursors to substantive scientific treatises, each account provides essential historical context for the intellectual contributions that follow. □



Fig. 1. Relative ice-drift velocities over the Arctic Ocean. Source: Untersteiner, N. (1990). Structure and dynamics of the Arctic Ocean ice cover. In *The Geology of North America, Volume L*: 37-52. Geological Society of America.

BOOK REVIEWS



An Illustrated Guide to Geology Around the Antarctic Peninsula, South Georgia and the Falkland Islands

by Bill Romey

(CD-ROM, Ash Lad Press, 2nd ed., 2005, \$10)

Reviewed by Jeff Rubin

With almost no plant life covering its exposed rocks, Antarctica is a paradise for both geologists and amateur rockhounds alike. Until now, however, there has not been a good photographic guide to Antarctic geology for the layman. Bill Romey's *Illustrated Guide* answers that need very admirably.

Professor of geography emeritus at St. Lawrence University and a fellow of the Geological Society of America, the American Association for the Advancement of Science, and the Explorers Club, Romey has done geological research in northern California, the Adirondacks, and Norway. After 22 years of teaching geology and geography at St. Lawrence, he has spent the last 15 years working as a shipboard lecturer and geologist on tour ships in Antarctica and elsewhere.

Romey wrote this guide to encourage Antarctic tourists "to look at some specifics of the geology in areas you may visit" and even suggests that "just as birders keep 'life lists' of bird species they've spotted, you can also begin a 'life list' of geologic features and rock types to enrich your visit and help you remember what you've seen."

This electronic book has four parts. The first, "Introduction, Cape Horn and Ushuaia," runs 23 pages and includes a very helpful glossary of geological terms.

The Antarctic Peninsula (130 pages) section covers approximately 50 locations, including all of the main geological sites of interest commonly seen on tourist cruises: Hannah Point's basalt "Big Damn Rock" and wide horizontal vein of red jasper; the turquoise-colored streak of copper mineralization (possibly malachite) on the cliffs near Argentina's Brown station; the Aitcho Islands' organ-pipe structures of columnar jointing; Pleineau Island's smoothly polished, well-jointed granites; the two big boulders at Walker Bay "set up as a veritable 'museum of paleontology and vertebrate anatomy' by naturalists like me who have found objects of interest along this beach"; and Baily Head's consolidated layers of volcanic ash in the cliff just south of the long black-sand landing beach.

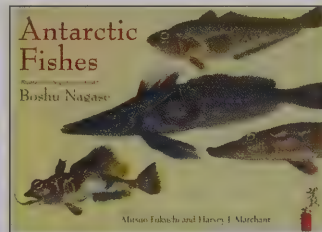
Romey also writes about lesser-noticed phenomena of interest—often in heavily-trafficked areas. Of Deception Island's Neptune's Bellows, he notes the reddish, conical structure just to the left of the entry: "A small satellite volcanic cone here has been sliced in half by erosion, revealing a marvelous view of the inside structure...It's a picture that confirms the accuracy of many text-book drawings of cross sections through volcanoes." At Petermann Island, he points out that the rock "contains abundant rounded xenoliths

from 15-60 cm in diameter of a fine-grained black basaltic material (greenstone?)." And at Hydrurga Rocks, he gives a "field name" to the spotted stone, calling it "leopard rock" in a double pun, since the islands' appellation comes from the leopard seal's scientific name, *Hydrurga leptonyx*.

The 45-page South Georgia chapter covers 20 sites. Of Albatross Island in the Bay of Isles, Romey writes a lament that he seems to feel at all landings: "Many visitors are so intent upon getting up to see the albatrosses that they fail to appreciate the geology at their feet." The large folds in the rock cliffs at Stromness—which told Shackleton that he had arrived at the correct bay after his epic crossing of the island—are beautifully illustrated, and another highlight is a series of 11 photos showing the steady retreat of the two big glaciers at Gold Harbor between 1994 and 2004.

A dozen places in the Falklands, including the islands' famous "stone runs," are covered in 24 pages. In Stanley, Romey does some geological detective work, revealing the fact that the Cathedral's beautiful, even-grained sandstone was not quarried locally, but was "brought all the way from England by homesick settlers."

Because this guide is on a CD, its hundreds of color photographs can be enlarged on the computer for enhanced viewing. A magnification of 200%, for example, brings out additional details. Unfortunately, in order to fit as many images as possible on the disc, they are not scanned at their highest resolution, meaning that at higher magnifications, focus is lost. Nevertheless, for anyone interested in Antarctic geology, this guide is a must. The CD is available from Ash Lad Press at P.O. Box 294, East Orleans, MA 02643 or via email <romeywd@comcast.net> □



Antarctic Fishes

Illustrated by Boshu Nagase

Text by Mitsuo Fukuchi and Harvey J. Marchant
(Johns Hopkins University Press, 2007, 136pp, \$45)

Reviewed by Jeff Rubin

This fascinating and gorgeous large-format book uses a traditional Japanese art form to beautifully illustrate some of the most interesting fish in the world, those which inhabit the Southern Ocean. Most of these species are rarely seen by anyone but Antarctic researchers and commercial fishermen.

Using the *gyotaku* (*gyo* = fish; *taku* = print, impression, rubbing) method, master artist Boshu Nagase has created 55 full-page color illustrations. With more than 30 years' experience, Nagase is regarded as the principal living exponent of this art form, in which a dampened sheet of fine, strong rice paper, not much thicker than tissue paper, is moistened and then gently molded to the surface of the subject (in this case, fish). Colored inks are dabbed over the paper to create a lifelike full-sized portrait. A dozen color photographs show the artist at work.

The results can be spectacular, as seen particularly in Nagase's beautifully-detailed drawings of Eaton's skate, the Smooth Oreo, the Bald Notothen, Nichol's lanternfish and the Ridge-scaled Rattail. Yet each fish illustrated is handsome in

its own way, for these direct impressions give a unique sense of the animals they portray.

The text describes the Southern Ocean and its biology, as well as the distribution, size, prey, predators, status of fishery—and, in some cases, even the taste!—for each of 54 species of Antarctic fish. Also included is information on the origin of the names of several species, among them *Neopagetopsis ionah*, which for some time was known only from specimens obtained from the stomachs of sperm whales, leading to its specific name honoring Jonah, the Hebrew minor prophet who allegedly survived being swallowed by a "great fish."

The authors, friends who share a passion for fly-fishing, are polar marine ecologist Mitsuo Fukuchi, currently a deputy director-general of the National Institute of Polar Research in Japan, where he has worked for more than 30 years, and Harvey J. Marchant, who worked as a biologist for the Australian Antarctic Division for 26 years. The pair hatched the idea for the book during a fly-fishing trip in Tasmania in 2000.

Originally published in Sydney in 2006 by Rosenberg Publishing, *Antarctic Fishes* deserves a place of honor on all Antarcticans' coffee tables, where it is sure to cause surprise and delight. □



The Antarctic From The Circle to the Pole

Photographs by Stuart D. Klipper

(Chronicle Books, 2008, 175 pp, \$40)

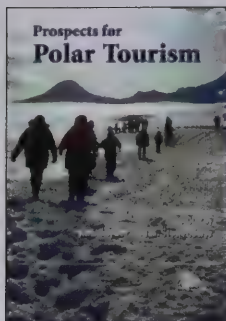
Reviewed by John Splettstoesser

Make room on your coffee table for this exceptional book of photographs by Stuart Klipper, another example of his skill in translating scenery into art. The 110 color photographs, bound in sturdy white covers with dimensions of 9 x 15 inches, provide impressive views of the many features of Antarctica that he visited as a recipient of five awards from NSF's Artists and Writers Program.

In addition to an introduction by Guy Guthridge, former manager of the program, there are essays by Stephen J. Pyne ("Beyond the Barrier: Ice Into Art," a take-off from his 1986 book *The Ice*) and a biography of Klipper by William L. Fox.

Klipper states that the subject material in the photographs encompasses three major all-inclusive topics—ethereal (atmosphere, light, blues of ice, etc.); actual (glaciers, mountains, wildlife); and human evidence (stations, field camps, aircraft, etc.). The photos are arranged according to 11 topics, moving progressively from the coast to the South Pole. The choice for the cover photo probably represents Antarctica better than any other in the book. It shows a red marker flag at Byrd remote field camp, with nothing else in the photo except for the horizon and the vastness of the West Antarctic Ice Sheet.

As a package of photos and essays, this book is recommended for anyone interested in Antarctica, whether they have been there or not. □



Prospects for Polar Tourism

Edited by J.M. Snyder and B. Stonehouse
(CAB International, 2007, 318pp, \$120)

Reviewed by Dave Norton (Arctic) and Jeff Rubin (Antarctic)

Nineteen authors contributed to 17 chapters of this review of the history, outlook and ramifications of tourism, which, the editors note, now constitutes "the single largest human activity in the polar regions." Development of the visitor industry in southern polar regions is emphasized in 12 or more of the 17 chapters (each of which has an excellent and fascinating, if sometimes rather incomplete, bibliography). The volume's editors—who themselves authored or co-authored 10 chapters—nevertheless trace much of today's practices in polar tourism to the formative stages that took place during the 19th century in the Northern Hemisphere's high latitudes.

In his chapter on the pioneers of polar tourism, John Snyder portrays 19th century forays into the Norwegian Arctic, Spitsbergen, and to Point Barrow in 1891 as trendsetting by the wealthy for the following century, when mass tourism was destined to envelop the world's visitor industry. Indeed, comparing the more leisurely northern with more recent southern experiences in high-latitude tourism invites an analysis of the interaction between scientific activities and leisure pursuits generally.

Northern polar tourism has grown especially rapidly since WW II into a necessary economic engine that motivates each of the eight Arctic nations in different ways. Snyder illustrates these contrasting motivations in his chapter on the topic. This chapter nevertheless illustrates the difficulty of generalizing from one Arctic nation to another. No two political entities offer a more striking contrast in tourism development than the U.S. (Alaska) and the Russian Federation (Chukotka and Kamchatka), neighbors across the International Dateline. Alaska's most heavily visited destinations, such as Skagway, Seward, and Denali National Park have been allowed to approach (perhaps exceed) saturation (*The Polar Times*, January 2007, pp. 23, 26-31; January 2008, p. 14) while tourism to recently-opened Arctic regions of the Russian Federation promises to be even more spectacularly newsworthy than the further development of the Antarctic visitor industry.

Alaska's approaches to tourism differ from other Arctic political entities, as illustrated by the chapter on Rural Alaska written by Henry Huntington and four co-authors and by the chapter on tourism in Nunavut, authored by Mike Robbins. In Alaska, the experiences of three widely differing communities—Anaktuvuk Pass, Kotzebue and Yakutat—are explored by longtime residents in each community. The pros and cons of various strategies for dealing with visitors seem to have become evident to each community independently in Alaska, as if there were no experiences from elsewhere from which to learn. In Nunavut, by contrast, the aspects of tourism development seem to have been under discussion more or less continuously since the 1970s. Robbins' account details cautious developments by a cross section of community interests, collaborating with two successive territorial governments, the Canadian federal government, and private enterprise.

If forced to summarize these contrasts in one di-

mension, a reviewer might propose that Nunavut generally has been able to develop proactive strategies for managing and optimizing the local benefits of high latitude tourism. In this dimension of sustainability and proaction, only Anaktuvuk Pass has capitalized on the industry's pros while avoiding its cons. Kotzebue—an early postwar destination for mass tourism above the Arctic Circle—and Yakutat have had to be more reactive to outside influences.

Although Arctic tourism is inherently difficult to analyze, this volume's balance between hemispheres might have been enhanced through soliciting chapters authored by experts from each of the six Arctic nations not directly represented: Greenland, Iceland, Norway, Sweden, Finland and Russia.

Readers expecting a definitive synthesis of polar tourism from this book have set their sights too high, too soon. Editors Snyder and Bernard Stonehouse nevertheless have made a significant contribution to a fast-expanding body of knowledge. Consider it a prelude to synthesis. We don't fully understand forces that retard and discourage more thoughtful syntheses of Arctic (boreal) and Antarctic (austral) experiences with high latitude tourism. Undoubtedly, the asynchrony of seasons contributes to keeping one guild of experts busy just when the other is more contemplative and ready to take a break from their own busy season.

Among the austral topics covered are ship-borne tourism, overflights, adventure tourism, Antarctic gateways, and management of tourism at South Georgia and at other Southern Ocean islands.

The most compelling—and useful—discussions come in the book's final section, "Managing the New Realities." As Snyder writes, "the tourism management dilemma is nothing less than influencing the number, distribution and behaviour of tourists to achieve tolerant social practices, economic benefits and sustainable resource conservation." The problem, he notes, is that self-regulation is the dominant form of managing tourists throughout both polar regions, relying upon "the tour industry's respect for laws and customs, and the tourist's willingness to exercise self-restraint."

Tourism management in Antarctica, as correctly noted by Stonehouse and co-author Esther Bertram, lacks several critical elements. There is "no overall strategy, based on clearly stated goals and objectives." While tour operators are required to monitor the effects of their activities, they have "no regulations, guidelines or advice" on how or even what they are supposed to monitor. There are "no rangers or inspectors" to supervise Antarctic tourism. The reason, of course, is money, or rather a want of it: "the industry pays no taxes for the privilege of using Antarctica, and the Antarctic Treaty makes no provision for collecting revenues towards the costs of effective management."

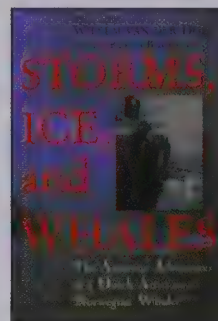
Antarctica's unique status as a "transnational" territory, which complicates all aspects of managing the continent, likewise makes overseeing tourism difficult. In contrast to other centers of polar tourism like South Georgia (owned by the UK), Svalbard (Norway) and Glacier Bay (Alaska), only Antarctica has no provision for setting upper limits to numbers of annual visitors or ships. Antarctic tour operators are free to land virtually anywhere, in contrast to restricted landing areas in South Georgia and Svalbard (and no landings permitted in Glacier Bay). In summary, the management of Antarctic tourism "has been left almost entirely to the industry" and "would benefit from an overall management plan for the continent."

Meanwhile, tourism in Antarctica is growing and diversifying, with more landing sites being visited by more people each year. "From our own observations and those of many colleagues," Stonehouse and Bertram write:

"...the first signs of degradation are starting to appear at heavily visited sites, in the form of

worn tracks and trampling. While these seldom persist over winter, they are indications of more serious and lasting changes. They are most readily detectable, not by "monitoring", but by simple, straightforward observation on the part of naturalists who visit the sites regularly, and would no doubt be interested to pass on their observations to any body capable of effecting remediation."

The most pressing need, they argue, is for "a simple system of reporting signs of wear and tear" which would be followed by inspection and recommendation for restriction of visits or even temporary closure of a particular landing site. This recommendation should be enacted by the Antarctic Treaty countries and the International Association of Antarctica Tour Operators—either jointly or separately—as soon as possible. □



Storms, Ice and Whales

By Willem van der Does

Translation by

Ruth van Baak Griffioen

(William B. Eerdmans

Publishing, 2003, 391pp, \$29)

Reviewed by Jeff Rubin

After decades of pioneering Antarctic whaling at South Georgia and in the South Shetlands, Norwegian Capt. Carl A. Larsen in 1923 organized the first whaling voyage to the Ross Sea aboard the *Sir James Clark Ross*, a factory ship he named after the British explorer who had discovered the sea in the summer of 1840-41.

Thanks both to the daring of Captain Larsen's enterprise and to his stature in the whaling world, the expedition attracted several polar veterans of note. The ice pilot, Capt. H. R. Gjertsen, had piloted Amundsen's *Fram*. Anderson, the third mate, was "an experienced old pole-rat" who had been to both the Arctic and the Antarctic many times. The expedition doctor (and Larsen's son-in-law) Ludwig Kohl had been with Filchner on *Deutschland*. And the German oil-boiler operator Karl Klick had been cook both on *Deutschland* and on Drygalski's *Gauss*.

The importance of the voyage was apparent to all who took part in it, and two participants have previously published books about it. Australian press correspondent Alan Villiers' account, *Whaling in the Frozen South*, was published in 1925, after having been partially serialized in *The Mercury* of Hobart and other Australian newspapers. Dr. Kohl's *Zur grossen Eismauer des Südpols* [To the great ice barrier of the South Pole] was published in 1926.

This book by Van der Does, a Dutch artist who signed on as a laborer after a great deal of very persistent efforts to get a place on the ship (and who was promoted to second bosun during the voyage), was first published in the Dutch East Indies in 1934. It has now been translated by Ruth van Baak Griffioen, whose grandmother was a cousin of Van der Does.

For the most part this is an interesting, entertaining book. However, Van der Does never uses three words when ten will do instead. His narrative is also interrupted in places by errors. King penguins do not "have a canary-yellow crest...just like the crest on a cockatoo;" whales can dive for longer than 15 minutes; Macquarie Island is part of Australia, not New Zealand; neither of Sir James Clark Ross' ships was called *Discovery*; and it is untrue that "none of the members of Scott's expedition left behind a single word about this disappointment [over Amundsen's arrival at the Pole ahead of them]."

When it comes to narrating the "action" of whaling—the spotting, chasing, harpooning, towing and processing of whales—Van der Does is a compelling writer. You will not soon forget his description of a mighty blue whale's death throes, given blow by blow over several pages. Nor can one deny the cruelty of the hunt, especially when reading that whales were often simply drowned in order to save the expense of a second harpoon shot.

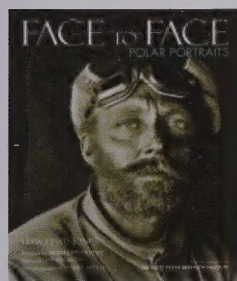
Having experienced whaling first-hand, Van der Does had a definite conclusion about the fate of the leviathons. Whales, he wrote, "are doomed to disappear." Their death simply "provides mankind with too many advantages."

Despite Captain Larsen's thorough planning and fitting-out of the expedition, one crucial aspect was overlooked. Because there was no way to bring the whales aboard, the whalers had to flense (strip the blubber from) them at sea. But the swell made it to dangerous to climb aboard the floating carcasses, so Larsen was forced to seek a safe harbor somewhere in the Ross Sea. He settled on Discovery Inlet, an indentation in the Ross Ice Shelf, or, as it was known then, simply "the Ice Barrier."

As usual, Van der Does has a lot to say about the Barrier, and for once his prolixity doesn't seem gratuitous:

"Despite its forbidding nature, the Ice Barrier makes one feel a great and lasting sense of having grown richer from encountering it. Although the Barrier cuts off the clear view to the south, one gets a better idea of endlessness here than anywhere else in the world. Anything that a man has preserved in his innermost being as his most powerful impression of nature sinks to nothing before the majesty of the Ice Barrier. The proud glory of the mountain peaks, the wide emptiness of the wilderness, the swelling expanse of the ocean—all lose their glory beside the overwhelming, deadly severity of this endless wall of ice, which shuts off a whole continent of nameless desolation, emptiness and cold from the living world around it."

Fittingly for an artist's book, *Storms, Ice, and Whales* is enlivened by 141 of the author's handsome pen-and-ink drawings throughout the text. A final note: the eight-page chapter "A Sailor's Funeral" is not to be missed. It beautifully describes the pragmatic but poignant ritual involved in a death at sea. □



Face to Face: Polar Portraits

By Huw Lewis-Jones
Photography by
Martin Hartley
Scott Polar Research
Institute

10 November 2008; 286pp

Special 'Expedition' Edition (ltd to 100 copies): £500
Hardback: £40, Soft-cover: £25

Review by Charles Lagerbom

In 2007, the Scott Polar Research Institute embarked on the FREEZE FRAME project, an attempt to digitize all their historical images from their vast collections. This daunting task involves over 20,000 photographic negatives from 1845 to the 1980s. Within this endeavor, Huw Lewis-Jones has produced a collection of polar portraits in a fascinating new book entitled *Face to Face: Polar Portraits*. With a foreword by Sir Ranulph Fiennes, an afterword by Hugh Brody and new photography by Martin Hartley, the collection of polar portraits and their accompanied brief descriptions are quite interesting, if

not downright arresting. The book also includes two essays appropriately entitled "Photography Then" and "Photography Now," that explore the challenges and art of capturing images in the polar regions from early days to the present.

Starting with the cover image of Cecil Meares, who posed for Herbert Ponting upon his return from the Beardmore Glacier on Robert Scott's ill-fated march to the South Pole, the book captures many of these polar people in various stages of their lives, at varying moments in their polar endeavors, or at different levels of action, inactivity or exposure to the cold. Some show the ravages of polar exposure being bloodied or frostbit, others are posed in front of books safely ensconced in warm offices, laboratories or libraries that interestingly do not in any way diminish their polar connections or achievements. Some are smiling, others show exhaustion, some seem caught in the moment as with Richard Byrd shaving after his South Pole flight. Some are modern scientists, early explorers, women, men, or Inuit children. The cast is as varied as the clothing, the timeframe or the background. They all, however, share the fact that for one brief moment they turned towards a camera and posed. They also all reveal some sort of steely determination or competency or maybe a weary acceptance that only comes from having lived, worked, studied or experienced first-hand the rigors of the polar regions.

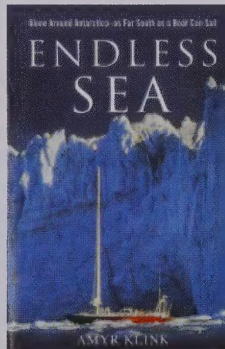
The book is wonderfully set up and offers a great assortment of polar personalities, many famous and many not so much. It is definitely a worthy addition to any polar library. The book *Face to Face: Polar Portraits* was published by the Scott Polar Research Institute in association with Polarworld, LTD. It can be found at <<http://www.polarworld.co.uk>> □

Endless Sea

By Amyr Klink,
trans. by

Thomas H. Norton
(Sheridan House, 2008,
272pp, \$19.95)

Reviewed by
Jeff Rubin



The Southern Ocean must sometimes have seemed endless to Amyr Klink, who in the summer of 1998-99

sailed his 50-foot, custom-built aluminum yacht *Paratii* completely around Antarctica by himself, remaining south of the Antarctic Convergence the whole time. This beautifully-written account is modest about the remarkable accomplishment, focusing instead on the day-to-day challenges and the small highlights that kept the author going during his 141-day voyage.

Klink had already made several epic journeys. In 1984, he rowed alone across the South Atlantic from Africa to Brazil, described in his book *100 Days Between Sea and Sky*. In 1990, during a 22-month voyage from Brazil to the Antarctic, the Arctic and back, he became one of the first two people to overwinter in Antarctica alone (Admiral Byrd's celebrated winter alone in 1934 at Advance Base is considered by some not to have been a true "solo," since he was close to assistance from other expedition members, who rescued him after he was poisoned by carbon monoxide when his stove vent filled with snow). While Klink was at Dorian Bay on Wiencke Island along the Peninsula, Frenchman Hughes Delignières wintered on his yacht *Oviri* in a bay near Pleneau Island, further south. The translation of Klink's book about the adventure, *Between Two Poles*, was published in 1995.

Paratii boasted a revolutionary 80-foot, unstayed, 360°-rotating, carbon-fiber mast, newly installed for the Antarctic circumnavigation. Waiting for the new design delayed his departure by a full year, but Klink had reason to be thankful for the mast. In combination with his Swedish non-electric self-steering mechanism, it enabled him to sail what he called his "big red truck" without a crew.

Klink writes matter-of-factly about the difficulties of the voyage. After a close call with an iceberg while he was napping, he cut his sleep ration to just 15 minutes at a time. Battling the homesickness he felt for his wife and infant twin daughters, he counseled himself: "Move on, move quickly, and remain alert." So that he could jump from his bunk at a moment's notice, he wore his boots for ten weeks continuously.

Southern Ocean sailing, he notes, was called "beyond hell" by sailors of old. During one gale, pulled only by her jib—the size of an umbrella—*Paratii* flew along at 22 knots. By New Year's Day 1999, his resolutions narrowed to just one: "Get out of here alive."

In the final weeks of his circling, Klink stopped at Dorian Bay, the site of his 1990 wintering, for a short rest (and a bath). From the two British caretakers at nearby Port Lockroy, he picked up a battered but precious suitcase filled with items from home: letters, newspapers, photographs, tape recordings of the twins' voices, even a new cellphone.

Interestingly, even surreally, technology enabled Klink to stay in touch with family and friends while en route. His wife Marina regularly sent him text messages giving Antarctic weather forecasts and updates from home. Her 45-page "land log" at the end of the book provides the perfect counterpoint to her husband's nautical account.

Klink's writing is interesting, clear and unheroic. He sums up his circumnavigation thusly: "I can't say that any particular purpose is served, nor any useful result derived from traveling months on end toward the single objective of returning to the original starting place. However, my useless circumnavigation has been my most satisfying achievement. It's hard to explain. There are mountains of useless milestones in the history of mankind, seemingly pointless feats whose importance lies merely in their completion, the symbolic value of having brought a dream to fruition." □

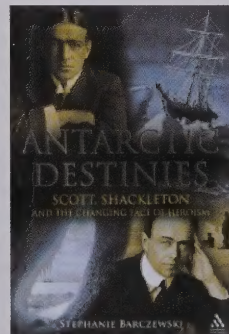
Antarctic Destinies: Scott, Shackleton, and the Changing Face of Heroism

By Stephanie Barczewski
(Continuum, 2007, 390pp, \$26.95)

Reviewed by
T.H. Baughman

In several respects I found this a difficult book to review and after some thought have come to the conclusion that this book is two volumes in one. The first portion will provide solid information to those readers who are new to the subject but will be of less use to the serious polar enthusiast.

The second half is quite interesting and reflects the five years of research and writing that went into the project. Overall, *Antarctic Destinies* is a fine volume, which will illuminate both this subject at hand and the discipline of professional history writing.



Perhaps I expected too much at the outset. I found the author's acknowledgements section (something that I realize the casual reader may skip) thoroughly delightful and perhaps raised my hopes too much at the outset. That made the first part of this work less satisfying.

In the first 114 pages, Barczewski recounts the story of the various Antarctic expeditions of both Robert Falcon Scott and Sir Ernest Shackleton. While this section, like the whole of the book, is well-written, I did have difficulties with some of her interpretations and omissions in her annotations. In the margin I noted roughly a dozen interpretations or nuances that bothered me, but I fully recognize that some of them would have given another reviewer no problem. Occasionally she fails to remind the reader that some of the things that Shackleton told people (for example, on p11) were, as his first biographer, H.R. Mill suggested, "true in the larger sense."

In the first half, Barczewski demonstrates why finding new and important breakthroughs can be difficult when one is dependent on secondary sources. She leans heavily on David Crane's fine biography of Scott (after all, it was published by Knopf), and for the most part she demonstrates a broad reading of the secondary materials at hand. One important omission: I did not notice any indication that she had used Michael Rosove's bibliography. I note that simply because she had a couple of places where she could have gotten additional insight.

The first half then makes no pretense of introducing new material and I would recommend that serious scholars may want to cruise lightly over it. This idea is not without precedent—I regularly recommend that people skip the opening chapter of my *Pilgrims on the Ice* lest an overdose of committees hurt their health.

But the second part is not to be missed. Here, no longer dependent on the interpretations of others and massively into the primary sources, Professor Barczewski shines. She started with the question: Why are the reputations of Scott and Shackleton so different, and why have they varied so greatly over time, and she does a fine job of answering that question. She tackles big issues and small. The relationship of the two men to World War One cannot be overlooked. She discusses the question of 19th century romanticism and how each man's work relates to that issue. She seems less secure in her application of the principle and practice of amateurism which was central to many in the late Victorian and Edwardian eras.

She provides what I presume will remain a definitive account of postwar memorials to the two men, whether in art, stone, music, or literature. Her diligence in slugging her way through the archival and physical evidence, and her ability to write well have resulted in an excellent account of these matters. For some readers, parts of this section may be a bit much, but the detail helps bring her to a better understanding of original questions.

She also tackles the rather more well-known issue of the rise and fall of the reputations of Scott and Shackleton. Some of this material will be familiar to those who have followed this debate for the past nearly 30 years, but Professor Barczewski provides an excellent summary of the melee and offers the occasional insightful remark on an issue missed by others.

This book should do well with the general public, and her title reflects the realities of selling books in an internet age: she works into the title a number of key words that people might search for on line. The book demonstrates for beginning students why historians place such value on primary sources. In the first part of the book, dependent on secondary sources with limited chances to strike out and bring something new and exciting to the reader, Barczewski is weakened,

handicapped by her sources. But in the second part (starting on p115), she gives a fine performance. Hour after hour of patient archival research affords her the material, from disparate sources, from which her excellent writing skills weave together a compelling narrative. This is a fine contribution to the literature, one which serious polar enthusiasts can read with profit and enjoyment. □

Obituaries

Martin A. Pomerantz

My good friend and colleague Martin A. Pomerantz died 26 October 2008 at his home in Northern California after a long bout with cancer. He was 91.

I met Martin sometime in the 1970s, undoubtedly at an AGU meeting. I got to know him much better in the 80s when I became the Space Physics Program Scientist at NASA Headquarters and then in 1985 he became one of my grantees when I moved to the US Antarctic Program at NSF. Martin was an extraordinarily gifted and broad scientist. He carried out decades of cosmic ray research in Antarctica (and elsewhere), did solar seismology, sub-millimeter astronomy and cosmic microwave background radiation cosmological measurements, all at the South Pole.

His list of awards and other honors is very long, but for the work he did with NSF (mostly with USAP) he received the Distinguished Public Service Award; a large feature in the USARP Mountains is named the Pomerantz Tableland; a large astronomical observatory building at South Pole is the Martin A. Pomerantz Observatory, called "Mapo" (rhymes with "may pole") by one and all; and an area a few miles from South Pole where Pomerantz and his collaborators set up their solar telescope has been called Pomerantzland by all Pole citizens for decades.

Martin's greatest talent was to have the vision to see how a new and important experiment could be done and then to gather together the very best people to do it. He made a study of just how Antarctica could be used and then convinced others of its value. He was almost single-handedly responsible for the development of South Pole into a major site for Astronomy.

His 2004 book *Astronomy on Ice—Observing the Universe from the South Pole* tells the story of his life in science and his fascination with polar regions after going to a parade in 1930 honoring Richard E. Byrd on his return from Antarctica.

It was a genuine pleasure and honor to have known Martin for so long. He was one of the nicest and most decent people I have known.

Martin is survived by his wife, Molly, and two children, Jane and Martin. □ **John T. Lynch**

Ralph Plaisted

Associated Press, WYOMING, Minn., 11 September 2008—Ralph S. Plaisted, an insurance salesman turned explorer who in 1968 led the first expedition that indisputably reached the North Pole over the ice, died 8 September. He was 80.

Traveling by snowmobile, Plaisted and three other men reached the North Pole on 19 April 1968. An Air Force weather plane verified their position a day later and gave them a lift back.

The 1909 attempt to reach the North Pole by explorer Robert Peary, long credited as the first to make it there, was never validated by anyone outside Peary's party.

In a 1988 Associated Press interview, Plaisted said

Peary was a great navigator but his own difficulties in the Arctic, including a failed attempt in 1967, had convinced him that Peary's claim was only wishful thinking.

Along the way, the Plaisted expedition encountered cliffs of ice 40 feet high, days of waiting for a two-mile-wide stretch of water to freeze, occasionally falling through the ice and temperatures reaching 65 below zero.

"(Peary) said he went to the North Pole in 37 days and came back over the same trail in 16, and we knew that couldn't happen because the roads we built were gone in a few hours," said Plaisted. "Up there, there're 5 1/2 million square miles of ocean and it's moving constantly."

His own expedition—474 miles as the crow flies from the starting point at Ward Hunt Island, Canada—took a little over 43 days. Because of the dangers, Plaisted said in 1988, he "wouldn't go back there if you put a million dollars on my desk right now."

In 1988, original navigational records uncovered from Peary's dog-sled voyage indicated the renowned explorer probably never got closer than 121 miles from the pole. But the Peary controversy has never been fully resolved.

"The (Plaisted) expedition ... really never got recognized," said Jerry Pitzl, the expedition's navigator, told the St. Paul *Pioneer Press*.

Besides Pitzl, the four-member team also included navigator Wait Pederson and scout Jean-Luc Bombardier, a nephew of Joseph-Armand Bombardier, a key developer of the snowmobile. The team used 16-horsepower Ski-Doos, made by the Bombardier company.

When the expedition reached the pole—which Plaisted called "one mass of jumbled ice not any different from anywhere else up there"—the group spent the night waiting for the U.S. Air Force plane to fly over and document their achievement.

"The next morning at 10 o'clock we had to move our tents some 2 miles so we could be in the same position as the night before," he said.

Plaisted is survived by three daughters, a son, a brother and two grandchildren. □

Donald Finkel

St. Louis Post-Dispatch, 18 November 2008, by Michael D. Sorkin—Donald Finkel, a celebrated poet whose topics included his trip to the South Pole, died 15 November. He was 79.

Mr. Finkel was poet-in-residence at Washington University, where he taught from 1960 until 1991. He wrote 14 books of poetry, with long narrative and frequently humorous free verse. His writing won prestigious awards. But his friends remember him best for his generous help to students, his enduring love for his late wife and writing partner, Constance Urdang, and his zeal for exploring everything around him.

In 1968, Mr. Finkel signed on with a scientific expedition to Antarctica sponsored by the National Science Foundation. It was a government program to send artists to Antarctica, and Mr. Finkel knew the man in charge.

"He loved the idea that he would be the first poet to go there," said Howard Schwartz, a former student.

A group of Russians was there at the same time, and Mr. Finkel became friends with them. They traded shots of vodka, and Mr. Finkel traded parkas with one of them. Mr. Finkel wore it back to the United States, not knowing that his new coat said "AWOL"—absent without leave—in Russian. "My dad had that parka for years," recalled a daughter, Amy Finkel of St. Louis.

Mr. Finkel wrote a book-length poem about his experience, "Adequate Earth." □

Membership News

Greetings from the coast of Maine. The APS Membership Center has long been working diligently to keep costs down but the realities of rising postage, printing and handling costs keep making it more difficult. As noted in our Treasurer's message on page two of this issue, all membership rates are scheduled to increase and the new rates will be announced in our forthcoming July 2009 issue of *The Polar Times*. In the meantime, there will still be an introductory or gift membership for new members which will be good for one year only at a cost of \$20 per new member, U.S. and \$25 for new foreign member.

Please consider establishing your own new member account as introduced in our Treasurer's message (three new members for \$50). Send a check to: Membership Center, P.O. Box 300 Searsport Maine, 04974. I will set up your account and enroll new members when and as you nominate them.

Almost the only way APS can maintain its viability is for existing members to find and enroll new members. A reasonable goal, simply stated is, "Each One Get One." If only one half of our membership did this we would see an influx of over 500 members which would markedly reduce our financial problems and allow us to maintain a moderate dues schedule. Clearly, your best

interests are served by our gift program. Getting our friends, families and colleagues enrolled in APS is a great way to share the interest you hold in polar matters. Bring someone or more on board this year.

Other cost cutting measures taken have included no longer supplying members with a return envelope with their renewal notices. We have also limited the number of bulk copies sent to officers, board members and other recipients. And constant mail reminders will no longer be sent to errant members. Membership rolls will be annually updated April 1st and any member not current will be removed from the roster. What all this means is that APS will notify members of their renewal in November for the year their membership is due to expire. They will then have until April 1st to let us know their intentions.

The membership center has received letters from some members who say they have not received issues of *The Polar Times* for quite some time. Please contact the membership center by the end of February for the January issue and by the end of August for the July issue if you do not receive them. We can make things right if you let us know in a timely manner. Contact us by email or regular mail at the addresses given below.

Finally, I have to say that I really enjoy hearing from members from around the country and world. Many send in little tidbits of info about themselves, and it constantly amazes me as to our wide range of diverse memberships. Please

contact me if you have any questions, comments or concerns about your membership or *The Polar Times*. And I want to send a special shout-out to Zenya Taniguchi of Japan who last week renewed his APS membership for the seventy-fifth year. Yes, that is correct. Mr. Taniguchi, who is in his mid-90s, joined the APS in 1934, the society's very first year! Congratulations, sir! It has been a pleasure being your APS membership chair. □

Charles H. Lagerbom

Membership Chair, APS
APS Membership Center
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Members In Remembrance*

Bolling Byrd Clarke • Travis Cresswell
Emma K. Himeno • Rudy Honkala • Robert Jensen
Martin Pomerantz • Marcia E. Root
Thomas "Tom" Edwin Taylor • Bob Thomson
George R. Toney

*Denotes members who the Membership Center was notified had passed away.

Major Contributors This Issue

Billy-Ace Baker • Abel Shafer
Peter Anderson •

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Secretary's Letter

Resource development has been high on the topic list in recent months. Especially forefront is the evolving project to someday bring natural gas of the North Slope of Alaska to market in the contiguous 48 states. This will be a monumental project on the order of the Trans-Alaska hot oil pipeline installed in the 1970s. The oil pipeline required extensive engineering to prevent thaw of the permafrost that could potentially destabilize the pipeline, and no less challenging will be the prevention of frost heave damage to the chilled gas line.

However, economics and politics, not engineering challenges, have prevented this project from moving forward. Politicians and businessmen have been trying to move the North Slope gas to market since the construction of the oil pipeline. Even with oil and gas prices hitting all-time highs this past summer and fall, the gas line is far from being constructed. There are many administrative hurdles yet to be overcome, and there are still companies to bring on board to the plan, even with the State of Alaska throwing in incentives worth over \$500 million to get the project rolling.

If sea ice thickness continues to decrease, this might open up commercial traffic lanes

across the Arctic, possibly leading to resource development across the region. The Russian staking of claims under the North Pole will most likely not be the last of what will be conceived as making a play for hard-reaching energy reserves. However, as with the elusive gas line, many moons, planets and stars are needed to line up before any large-scale gamble will be taken to exploit technically difficult and logistically hard-to-reach resources, such as those that lay under the Arctic Ocean and Archipelago. Keep your eye on the Alaska natural gas line; it may turn out to be a fairly accurate barometer of the potential for resource exploitation of the Far North.

Enjoy this issue of *The Polar Times*, and perhaps by our next issue the energy policies of the new presidential administration will have taken shape. □

Kevin Bjella
APS Secretary

About Our Back Cover

Meltwater stream on Ward Hunt Ice Shelf - 2008
Pax Arctica Expedition. © Luc Hardy / Sagax □

